NETWORK WORLD
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CORPORATE RESTRUCTURING

UB heads NonStop toward net redesign

BY SKIP MACASKILL

Santa Clara, Calif.

Ungermann-Bass, Inc. is in the midst of a corporate restructuring under which it will form three business units and leverage parent Tandem Computers, Inc. technology for a push into fault-tolerant networking.

It has only been two months since Roel Pieper assumed the hot seats of UB president and chief executive officer following founder Ralph Ungermann's departure, but a top-to-bottom corporate realignment is already well under way.

Pieper is trying to reverse UB's recent performance record, which includes a $6 million loss last quarter. He expects the company to break even this quarter and hopes to make the $350 million firm profitable next year.

According to industry sources, the key to UB's turnaround will be a new fault-tolerant network architecture, dubbed NonStop Access for Networking, that is being jointly developed by UB and Tandem.

The vendors are pitching a plan in which users employ fault-tolerant Tandem Himalaya computers as servers to be linked in a dual-hub architecture to desktop computers outfitted with dual-port adapter cards.

See NonStop, *page 62*

Interview with Roel Pieper of UB, page 19.

SynOptics outfits ATM switch for WAN duty

BY SKIP MACASKILL

Santa Clara, Calif.

SynOptics Communications, Inc. this week will announce five new versions of its LattisCell Asynchronous Transfer Mode (ATM) switch designed for use in ATM wide-area networks.

Different models of the LattisCell ATM switches will support the 155M bit/sec Synchronous Optical Network (SONET) Optical Carrier (OC)-3 interface and its Synchronous Digital Hierarchy (SDH) European counterpart, as well as the 45M bit/sec T-3 standard. They are due out by the first quarter of next year.

The switches will be SynOptics'

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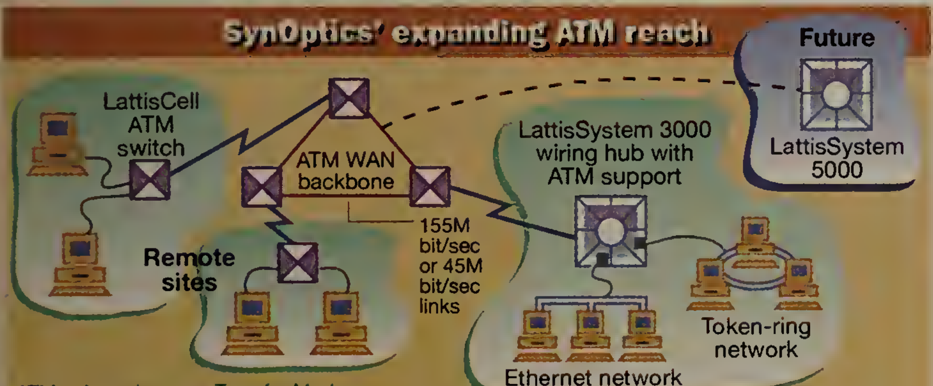
SynOptics' expanding ATM reach
Future
LattisCell ATM switch
ATM WAN backbone
LattisSystem 3000 wiring hub with ATM support
LattisSystem 5000
155M bit/sec or 45M bit/sec links
Remote sites
Token-ring network
Ethernet network

ATM = Asynchronous Transfer Mode

SynOptics' LattisCell ATM switches have been upgraded to support Synchronous Optical Network and T-3 interfaces to let users build ATM backbones. The backbone will support ATM work groups, LANs anchored by LattisSystem 3000 wiring hubs and the next-generation LattisSystem 5000 hub.

GRAPHIC BY SUSAN SLATER SOURCE: SYNOPTICS COMMUNICATIONS, INC., SANTA CLARA, CALIF.

NEWSPAPER
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Novell aims to give mainframes new role as NetWare servers

BY CARYN GILLOOLY
AND MAUREEN MOLLOY

San Jose, Calif.

Novell, Inc. is developing software that would give IBM mainframes support for native NetWare protocols, enabling them to be configured as servers on NetWare LANs.

The software will let mainframes support Novell's Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) transport protocol, giving the host an IPX address and enabling it to appear to NetWare clients as a node on the NetWare local-area network.

That would lay the groundwork for development of third-party applications that would let the host support NetWare backup, storage, database, file-access and other functions.

Novell, which declined to comment, is believed to be working on the software in conjunction with another vendor. The software is expected to run both on the mainframe and on adjunct processors, such as IBM's 3172 Interconnect Controller, which attach LANs to mainframe channels and help off-load protocol processing.

> **"It sounds like [Novell is] on to something great, but is it something that will make it past the drawing board?"**
>
> Cheryl Currid, president, Currid and Co., Houston

Other vendors offer similar software for linking Transmission Control Protocol/Internet Protocol nets to mainframes. IBM, for example, offers its 3172-based TCP/IP Off-load facility, which supports TCP/IP communications processing on behalf of the host.

"There are users who have serious interest in running NetWare-based off-load, so you can run native SPX applications in MVS without having to gateway through OSI or TCP/IP," said one source who requested anonymity. "This will provide a phenomenal degree of improvement in the way you integrate NetWare LANs with mainframes."

Frank Dzubeck, president of Communications Network Architects, Inc. in Washington, D.C., agreed.

"It'll provide a much cleaner way to [access the] mainframe," he said. "This would make the mainframe a full player inside the NetWare net."

And third-party developers said the product would simplify their lives.

"This would take care of the connectivity issues," said Bill Hiller, vice president at Capella Systems, Inc., a software developer in Atlanta. "You'd still have to write the software that lets you go to the mainframe disk drives, for example, but that's the easy part.

See Novell, *page 62*

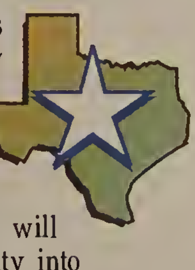
IP net helps Texas dole out benefits

BY JIM DUFFY

Austin, Texas

The Texas Department of Human Services (TDHS) is hoping to improve the health of its automated welfare delivery system by migrating it to a more manageable and flexible IP internetwork.

TDHS is entering the first phase of a three-year project to transform the host-controlled network that supports its welfare delivery applications into a router-based, peer-to-peer LAN internet.



The internetwork will offer greater visibility into and control over existing local-area networks, a reduction in equipment and staffing costs, and more flexibility in network configuration and application deployment.

Those benefits as well as gains in caseworker productivity are expected

See Texas, *page 62*

House eyes overhaul of network industry

BY ELLEN MESSMER

Washington, D.C.

After months of debate on communications policy, top lawmakers in the House last week introduced two bills that could dramatically alter communications law, freeing the RBHCs from current business restrictions and spurring competition in local loop and cable television services.

A bipartisan bill introduced by Reps. Edward Markey (D-Mass.) and Jack Fields (R-Texas), dubbed the National Communications Competition and Information Infrastructure Act, would lift the 1984 Cable Act ban on joint ownership of telephone and cable facilities while boosting local loop competition.

The other bill, the Antitrust Reform Act of 1993, is backed by two key congressmen. It would overhaul the Modified Final Judgment — to allow regional Bell holding companies into interexchange services and manufacturing — thus shifting power from the U.S. District Court to federal and state agencies.

Introduced by Reps. Jack Brooks (D-Texas) and John Dingell (D-Mich.), the bill would impose some restraints in exchange for the new freedom. For example, it calls for a five-year time delay on an RBHC's unfettered entry into long-distance service outside its own region. It also puts new restrictions on the freedom in information services that the RBHCs won from U.S. District Court Judge Harold Greene two years ago.

If the bill passes through Congress and wins presidential approval — not easily accomplished when fundamental changes are proposed — the seven RBHCs will no longer be arguing over the Modified Final Judgment before Greene, as they've done for the past 10 years.

See House, *page 6*

Briefs

Novell gets picture, readies OracleWare. Novell, Inc. this week is expected to bring out its first video product, dubbed NetWare Video 1.0. The product will be a set of NetWare Loadable Modules (NLM) that will provide video-playback capabilities across a NetWare local-area network. This capability was previously available as a NetWare add-on product from Fluent, Inc. But since Novell acquired Fluent, the product has been made into an NLM.

Separately, Novell, in conjunction with Oracle Corp., last week announced delivery dates and pricing on the OracleWare integrated NetWare and Oracle7 database offering. The first product in the OracleWare family is called OracleWare System — NetWare Edition 3.12, a package that includes NetWare 3.12, Oracle7 Server for NetWare, Oracle Office, Oracle Glue and on-line integrated documentation. The package will be available Dec. 6, starting at $3,095 for a five-user version. Similar packages for UnixWare and NetWare 4.X will be available in the first and second quarters of next year, respectively.

1-800 OUTAGES. AT&T last week said it lost a pair of network control points — the net systems that perform 800-number translation — in Denver for two hours on the morning of Nov. 23. AT&T said the incident interrupted toll-free service for an unspecified number of users. The carrier would not divulge the cause of the problem.

Criminal virus alleged. The president of MJL Design of New York, a software development company in North Babylon, N.Y., last week became the first person to be arraigned on felony charges under a New York state law that sets stiff penalties for computer tampering. Michael Lafaro last week was charged with intentionally infecting a customer's network with a business-threatening virus. The Nassau County Police Department charged that Lafaro had his employee, John Puzzo, install the virus in an account-tracking application developed for furniture company Forecast Installations in Westbury, N.Y. The owner of Forecast Installation allegedly was dissatisfied with the system and refused to pay a $2,400 balance on his bill. Lafaro's motive, police charge, was to collect payment on the system or shut it down. Lafaro and Puzzo, both of whom have denied the charges, face up to seven years in prison and a fine of $5,000 to $10,000 if convicted.

Retix readies OSI-TCP/IP combo for RS/6000. Retix last week announced Open Systems Interconnection application software for IBM's RISC System/6000 that works over both OSI and Transmission Control Protocol/Internet Protocol networks. The applications include 1988 X.400 messaging; X.500 Directory Services; File Transfer, Access and Management; and Virtual Terminal.

In the Hundt. Vice President Al Gore is expected to swear in Reed Hundt as the new Federal Communications Commission chairman today. The Senate confirmed Hundt as chairman in a late night vote on Nov. 19. Hundt will replace interim chairman James Quello as head of the commission.

Backing up NetWare. Palindrome Corp. this week is expected to be one of the first vendors to bring out a version of its backup software that is fully Novell, Inc. NetWare 4.X compatible. The move follows recent complaints from NetWare customers that a lack of third-party backup software has prevented them from upgrading to 4.X (*NW*, Oct. 25, page 1). As expected, Palindrome will bring out NetWare Archivist SMS version 3.0. The new version, like the existing one, is a NetWare Loadable Module that resides on the NetWare server. Because the new version fully supports Novell's Storage Management Services specification, it not only backs up network files, but is also able to back up the NetWare Directory Service. The product will be available immediately for $1,695.

Contacts

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Network HELP desk

Network World *tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Dana Thorat at (800) 622-1108, via fax at (508) 820-3467, via the Internet at djt@world.std.com or via CompuServe at 73244,2673.*

We have two customized NetWare Loadable Modules (NLM) on our NetWare 3.11 file server. Before loading an NLM, the other must be unloaded. This happens every night at different times. Is there a utility that would allow us to unload and load the NLMs from a user workstation without using Rconsole? I need to be able to execute this batch file at any time.

Kevin Pendergast, Chicago

Ronald Nutter, escalation manager of 900 Support, a 24-hour, seven-day-per-week NetWare technical support company in Lake Oswego, Ore., replies:

Knozall Systems, Inc.'s NLMauto, NLMauto Professional and NLMerlin are three utilities that allow you to automatically unload NLMs at the server without anyone being present. NLMauto is a basic package that may suit your needs because it can load and unload NLMs on a preprogrammed schedule.

NLMauto Professional adds its own decision-making capability and allows users to write an executable script in a BASIC-like language. And NLMerlin takes this a few steps further by allowing NLMs to be loaded and unloaded based on certain conditions, for instance if the system volume is 70% full.

NLMerlin also provides some network management functionality by automatically running jobs at predetermined intervals and taking corrective action if necessary or appropriate. NLMauto costs $395 per server, NLMauto Professional is $495 per server and NLMerlin is $2,195 (includes two server agents and 20 client workstation agents). For more product information, call Knozall Systems at (800) 333-8698.

Several readers have contacted *Network World* looking for information about obtaining Serial Line IP

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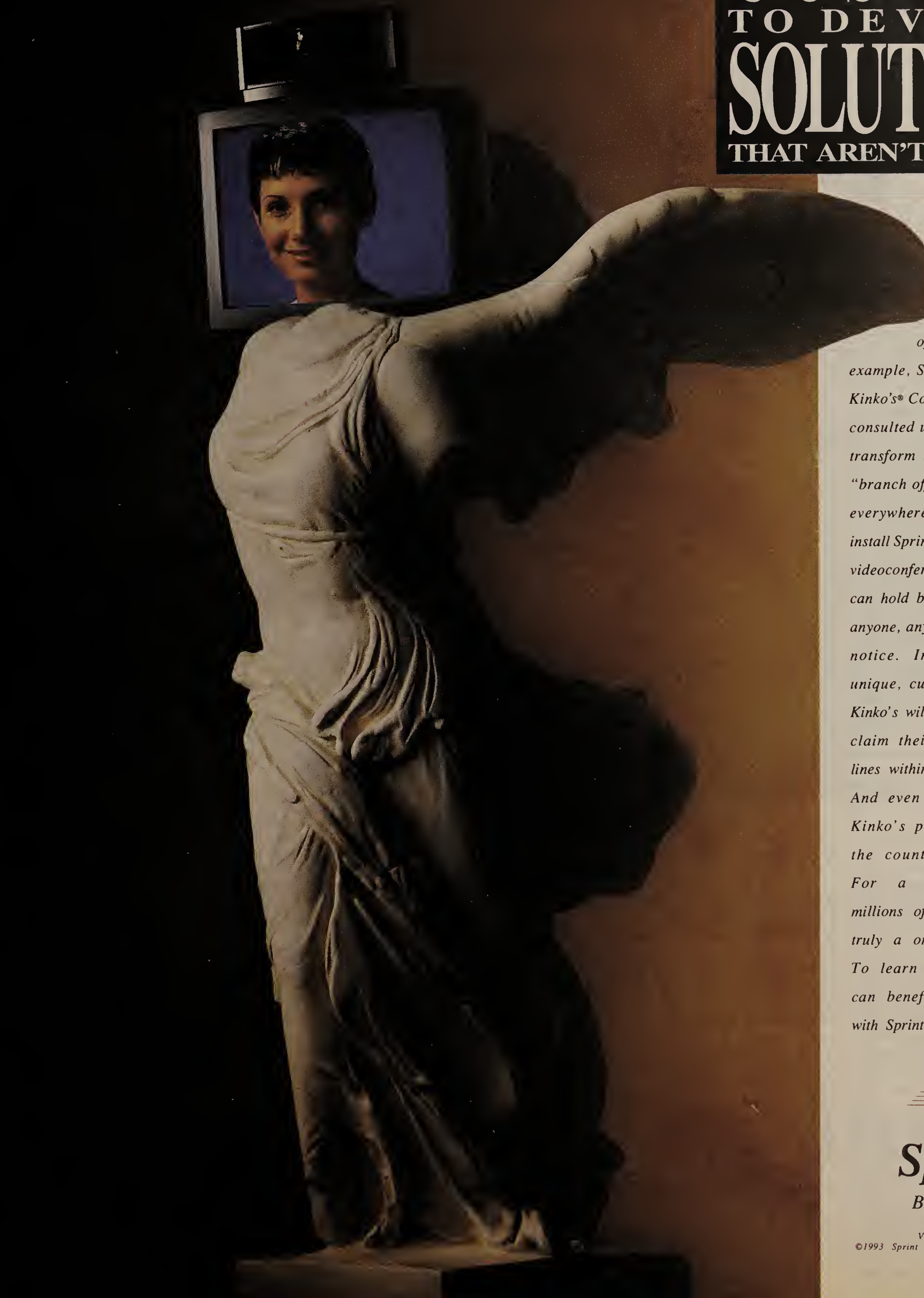

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Group asks govt. to make ANSI X12 EDI standards mandatory

BY ELLEN MEMER

Washington, D.C.

A health care industry group studying ways to reduce medical costs last week recommended that Congress enact legislation requiring insurance companies, hospitals and physicians to adopt standards-based EDI systems to streamline claims processing.

> "EDI is the key to where we go in the future. In the health care industry, we're not quite at the quill pen level, but we're close to it."

Bernard Tresnowski
President and CEO
Blue Cross and Blue Shield Association

The Workgroup for Electronic Data Interchange (WEDI) said health care providers should be required to use five new ANSI X12 EDI transaction sets for claims processing as part of the health care reform effort advocated by the Clinton administration. WEDI said the health care industry could save $42 billion over six years by processing claims electronically.

Established in 1991 by then-Secretary of Health and Human Services Louis Sullivan, WEDI was asked to put forward an action plan for automating communications between insurance companies, physicians and the government, which spends billions of dollars each year on Medicare. WEDI members represent dozens of insurance companies as well as the American Hospital Association, the American Dental Association and the American Medical Association (AMA), among other organizations.

Last year's WEDI report pointed to a lack of EDI standards for health care claims processing, but the 1993 report released last week notes that five ANSI X12 claims-processing standards this year reached draft status, a level that is considered stable. WEDI is now calling for a government mandate of broad-based implementation for all insurance claims processing.

Under the WEDI proposal, in-surance companies and physicians would start using the five "core" claims-processing transaction sets by the end of 1994. WEDI, which also hopes to win tax credits and accelerated depreciation on EDI capital expenditures, is also asking Congress to establish uniform confidentiality and privacy rights to protect electronic medical data.

"Whatever kind of health care reform emerges from Congress next year, EDI is the key to where we go in the future," said Bernard Tresnowski, president and chief executive officer of Blue Cross and Blue Shield Association, and cochair of WEDI.

The health care work group noted that eight other EDI transaction sets now under development in ANSI's X12 insurance subcommittee should be considered for mandatory use in the future.

The five claims-processing standards that WEDI wants to make mandatory have begun to be implemented in EDI software, and there are many pilot projects starting across the country to test standards-based electronic claims processing, said Jeff Kessler, a founder of the Minneapolis-based consultancy EDI Partners, Ltd.

Much of the impetus for standards has come from the federal government, where the Health Care Finance Administration (HCFA) requires insurance companies with HCFA Medicare contracts to show they are able to electronically process the Health Care Claim and Health Care Claim Payment/Advice EDI formats by Jan. 1, 1994.

While large insurance firms are getting ready for EDI claims processing, hospitals and clinics by and large are not, Kessler said.

While a congressional law mandating use of the five EDI claims-processing formats may seem severe, the idea has gotten the backing of the AMA.

"My constituents have concerns," said Lynn Jensen, vice president of the AMA. "But there's a consensus, and we're ready to move forward with implementation."

Using standard EDI formats, physicians will be able to ascertain coverage eligibility of a patient, receive payments and get an explanation of benefits once the system is in place, Jensen said.

"Until standards are adopted, physicians are reluctant to invest due to fear the technology will become obsolete rapidly," he noted.

Software based on the ANSI X12 standards for claims processing is available from many firms, with several likely to jump on board.

Malvern, Pa.-based EDI Able, Inc. offers medical claims-processing software. John Witten, EDI Able's director of product and business development, said his firm sells health care EDI software to systems integrators, such as Shared Medical Systems, Inc. (SMS), which specialize in hospital software and services.

Kessler pointed out that most doctors use a practice management system for shared use, and the provider of these distributed software systems, such as SMS, ExecuFlow, Inc. and Keystone Medical Systems, Inc., are likely to be the sources bringing X12 EDI standards-based software into the physician's environment. ⧉

Microsoft ships MAPI kit

BY ADAM GAFFIN

Redmond, Wash.

Microsoft Corp. last week came a step closer toward releasing its long-awaited Messaging Application Programming Interface (MAPI) when it announced it was shipping a beta version of a MAPI software developer's kit (SDK).

The SDK will let developers begin writting applications that use MAPI Version 1.0, which will be included in versions of Windows and Windows NT expected to come out in mid- to late 1994. MAPI is an application development tool set that makes it easier for developers to create applications that integrate complex electronic mail systems and easy-to-use user interfaces.

MAPI 1.0 will give developers the ability to add far more messaging capabilities to their applications without the extensive programming now required to use the current "version 0."

It will support the Common Messaging Calls for mail-enabling and application messaging that were released by the X.400 API Association (XAPIA) last year. The calls represent an attempt by XAPIA to bring a level of standardization to the messaging arena.

Even with this latest announcement, MAPI remains behind the rival Vendor Independent Messaging (VIM) API backed by Lotus Development Corp., one analyst said.

"[Microsoft] has been struggling with [MAPI] for a number of years," said David Ferris, president of Ferris Networks, a consulting company in San Francisco that specializes in E-mail.

VIM today remains a more mature and usable API and Ferris said Microsoft has lost out entirely in certain sections of the messaging arena, such as network directories.

He added that managers looking at buying E-mail systems should pay far more attention to other issues than support for MAPI or VIM because few will ever have reason to access these APIs directly.

But Judith Rosall, research director for the electronic-messaging program at International Data Corp. in Framingham, Mass., strongly disagreed.

She said users responsible for buying and installing a large E-mail system must know what sort of functions an API will support.

"You just can't go in there and expect everything" from an API, she said.

Rosall added that both Microsoft and Lotus have backed down considerably from their once-hostile positions on interoperability and now pledge to support efforts by XAPIA to develop common messaging calls. A key question, she said, is whether these calls, which now support relatively simple messaging systems, will be expanded to include more complex tasks such as directory synchronization.

Meanwhile, more than 80 developers are already working on applications that use MAPI, including WordPerfect Corp.

"WordPerfect 6.0 for Windows and WordPerfect InForms utilize simple MAPI as a mail-enabling technology," said Eldon Greenwood, product marketing director of WordPerfect Office. "MAPI support will also be embedded into WordPerfect Office, allowing it to work with mail-aware applications that have a MAPI interface."

©Microsoft: (206) 936-6956.

IBI, Uniface products to debut at show

BY PETER LISKER

Chicago

Information Builders, Inc. (IBI) will introduce software to give Lotus Development Corp.'s Notes users access to multiple vendors' databases, while Uniface Corp. will show a Macintosh version of its client/server application development tool here next week.

Microsoft Corp. is also expected to make an announcement about its SQL Server database, but details were unavailable. These announcements and others are expected at the Database World & Client/Server World conferences Dec. 7-9.

IBI will unveil Notrix/E, a software package based on an existing product from IBI partner Bond Technologies, that will give Notes users access to the many relational and nonrelational databases supported by IBI's Enterprise Data Access/SQL (EDA/SQL) line of database access software. EDA/SQL provides access to databases from Digital Equipment Corp., IBM and Oracle Corp., among others.

Notrix/E will provide for the bidirectional exchange of data between Notes and other databases, so relational data can be employed in Notes documents.

The software, designed to run on OS/2 Notes servers, uses the EDA/SQL application program interface (API) to connect to EDA/SQL and the Notes API to access Notes. The product is similar to Trinzic Corp.'s InfoPump offering.

"By utilizing EDA/SQL, Notrix/E will provide completely transparent client/server access to enterprisewide data," said John Senor, vice president of IBI's EDA division.

IBI will begin offering Notrix/E in the first quarter of next year. Pricing will vary by configuration.

Uniface Corp. will announce Uniface for Macintosh, a version of the company's client/server application development software for Apple Computer, Inc. computer users. Developers will be able to use the software to build enterprise network applications independent of databases on the network.

The C-code-driven product uses Uniface's Information Engineering and Design Facility, a modeling approach to application development. Code developed under Uniface for Macintosh is directly portable to not only Macintosh computers, but also systems running Windows, Motif, DEC's VAX VMS and OS/2.

"With Macintosh support, we foresee a tremendous enhancement of the capability to develop applications using the widest range of platforms in use today," said Anu Shukla, Uniface's vice president of worldwide marketing.

Uniface officials declined to discuss the new product further, including pricing and availability. ⧉

CORRECTIONS

The story "Unisys revamps its SNA-Unix product line" (*NW*, Nov. 8, page 11) gave erroneous pricing information for three of Unisys' Enhanced Systems Network Architecture (e/SNA) products. The e/SNA API costs $1,800, the e/SNA TN3270 costs $2,300, and the e/SNA DSNX-E costs $2,700.

A brief on page 2 of the Nov. 8 issue incorrectly stated the name of Digital Analysis Corp., which makes the OS/Eye*Node management product.

The maximum speed at which users of Sprint's frame relay service can send bursts of data is 1.536M bit/sec, not 1.024M bit/sec as reported in a recent story (*NW*, Nov. 8, page 31).

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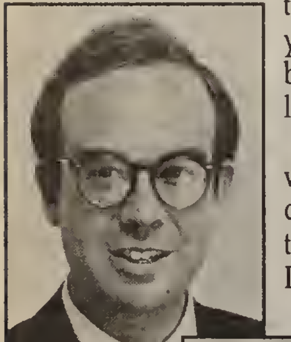
Circle Reader Service #6

House

Continued from page 1

As a first step, the RBHCs will be able to offer interexchange services within their own territories, if they can convince both the Federal Communications Commission and the Department of Justice. If they want to provide intrastate long-distance, they'll have to convince state regulatory authorities to let them into this market.

After 18 months, the RBHCs would be allowed to carry interexchange traffic outside their regions using facilities resold from other carriers such as AT&T. But they will not even be able to ask permission to provide services outside their regions using their own facilities until five years after the bill becomes law.



BOUCHER

MARKEY

The Bells will have to convince the Justice Department there is "no substantial possibility" they could use their monopoly powers to impede competition. The FCC would have to determine whether RBHC entry would result in higher or lower rates and "expedite delivery of new services," among other criteria.

"This establishes a standard we can meet," said BellSouth Corp. spoke man Bill McCloskey. The RBHCs issued a joint statement expressing guarded approval of the bill, but called the five-year delay on full entry into long-distance "counter-productive in an increasingly competitive enviroment."

MCI Communications Corp. hailed the legislation, saying it preserves the spirit of the original MFJ. MCI Chairman and Chief Executive Officer Bert Roberts said the bill "maintains the ground rules under which the competitive long-distance industry has flourished."

The portion of the 72-page Antitrust Reform Act that offers the most easily obtained MFJ relief is the section on manufacturing. An RBHC would simply apply at the Justice Department and, unless authorities protest, the company can start manufacturing under a separate affiliate. Manufacturing operations would have to be based in the U.S., although the FCC would be allowed to grant waivers.

Although the RBHCs can already offer information services, including electronic publishing, the bill places new restrictions on these activities.

The Bells would have to engage in electronic publishing under a separate affiliate or joint venture. And they would not be allowed to hire as corporate officers any current or former sales and marketing personnel.

That aspect won approval from The Newspaper Association of America, which said the guidelines would prevent the Bells from having an anticompetitive advantage. "It also creates opportunities for newspapers and the Bells to work together," said Frank Bennet, president and CEO of Hearst Corp.

MERGING TELCO AND CABLE

While the Brooks-Dingell bill focuses on the MFJ restraints, the National Communications Competition and Information Infrastructure Act would lift the ban on cross-ownership of cable and telephone operations. This would let cable companies compete as common carriers and carriers compete as cable providers in their respective home markets.

The legislation puts a new spotlight on open network issues, requiring local carriers to provide access to databases and signaling systems — even to the telephone poles where lines are strung.

Going beyond the Open Network Architecture (ONA), collocation and equal access proceedings that have preoccupied the FCC for years, the bill would preempt state jurisdiction, forcing open network changes down to the state and local level.

In addition, the bill calls for the FCC to conduct a study on the technical and economic feasibility of providing digital services to all homes and businesses. Based on the report's findings, the FCC would be required to mandate digital service where appropriate, although no specific timetable was laid out.

"This is the road map for the information superhighway," said Markey on Capitol Hill last week.

Although the act lifts the cable-telephone cross-ownership ban, it does so with a proviso that would require telephone companies offering cable service to make 75% of cable bandwidth available to competitors. "We don't impose that regulation on the cable companies," said Rep. Rich Boucher. (D-Va.)

The bill does not allow wholesale buy-outs of cable companies by telephone companies, and it only permits joint ventures under limited circumstances, such as to serve rural areas. The purpose of this restriction is to force the telephone companies to build their own fiber-optic facilities, not just buy up competing services, Boucher said.

"It's a good foundation for Congress to use to address communications issues," said Thomas Tauke, vice president of government affairs at Nynex Corp. "We hope we can move toward regulatory parity among providers of services."

Users seem to be in favor of relaxing current restrictions. In a recent *Networld World* survey, 83% of net managers said the cross-ownership ban should be dropped (*NW*, Oct. 25, page 1).

The National Cable Television Association (NCTA) also welcomed the move to rescind much of the 1984 Cable Act. Decker Anstrom, acting president of NCTA, said he was glad Congress recognized the need to preempt state and local laws that prevent competition in the local telephone market.

Brian Moir, attorney for the International Communications Association, applauded the attempt by Congress to broaden the FCC's ONA effort, under which local exchange carriers have had to unbundle network services to give competitors access to them.

"There's no access to the local exchange networks except at their offices — not at curbside or poles," Moir said. The new legislation would give competitors further rights, such as letting them deploy their own software on local exchange carrier switches.

The bill directs the FCC to convene a Federal-State Joint Board to advise the commission regarding interconnection rules, although the FCC can use existing access rules when applicable.

Bradley Stillman, attorney with the Consumer Federation of America (CFA), criticized the bill for being vague in its definition of an open network. The CFA also considers the preemption of state authority too broad. "It is imperative the states be given more authority to manage the transition to competition," the organization said.

MCI Communications Corp. will put some pressure on local exchange carriers next year when it launches a trial to deliver cable television and local telephone service — at or below current prices — to customers in Alexandria, Va.

MCI will join competitive access provider Jones Lightwave, Inc. to wire 50 homes for broadband cable service. The March trial and a second trial in Chicago during the second quarter are part of MCI's search for a new means of access into the local loop, said Nate Davis, MCI's senior vice president of access services.

Using cable to reach callers would free MCI from paying access fees to local carriers when terminating calls. MCI rival AT&T also has the potential to reduce access costs with its planned acquisition of wireless giant McCaw Cellular Communications, Inc.

The trial will involve an upgrade to portions of a CATV network owned by Jones Intercable, Inc., an affiliate of Jones Lightwave, to connect customers to MCI's network for long-distance service. The Chesapeake and Potomac Telephone Co. of Virginia, a Bell Atlantic Corp. operating company, will continue to provide local phone service over the traditional copper wiring in this first phase of the project.

The Chicago test will be more ambitious. Jones Lightwave and MCI plan to interconnect a Jones Intercable system in a Chicago suburb with Ameritech's phone network to provide both local and long-distance service.

BY BILL BURCH

SynOptics

Continued from page 1

first switches designed for WAN use. The LattisCell line has been limited to use in work groups, delivering dedicated 155M bit/sec pipes to the desktop. The WAN support will allow users to position the device as an ATM backbone switch, creating private ATM-based networks.

"The WAN support will let users integrate disparate ATM LANs across the wide area as well as traditional LANs through the LattisSystem 3000 hub," said John Jaeger, product-line manager for ATM at SynOptics. "This access will help speed acceptance of ATM because a seamless end-to-end connection across the wide area has always been attractive to users."

Each of the five new 16-port LattisCell switches will support a different combination of physical interfaces and media types (see graphic, this page). All the physical interfaces are fully compatible with the specifications being developed by the ATM Forum, ensuring interoperability with other switches and networking devices that also offer standardized interfaces.

Like the existing LattisCell line of work group ATM switches, the new wide-area versions will have an overall capacity of 5G bit/sec.

In the future, the switches will scale to larger sizes that support SONET rates up to OC-48, according to Bruce Van Nice, manager of systems marketing at SynOptics. The company is also planning a modular version of the switches that will fit into its LattisSystem 5000 hub (*NW*, Sept. 13, page 1).

SynOptics was under pressure to provide the WAN capabilities to catch up with its major competitors in this market — Fore Systems, Inc., Network Equipment Technologies, Inc.'s Adaptive division and Newbridge Networks, Inc.

"This rollout may be a case of SynOptics learning a lesson from Adaptive," said Todd Dagres, vice president of data communications at The Yankee Group, a Boston-based consultancy. "Adaptive lost some early ground to its competitors because it didn't roll out WAN functionality quick enough."

The real question however, is whether the switches will interoperate with other ATM-compatible products and services. "Without that interoperability or certification from the carriers [saying] that it works with their switches and services, LattisCell could be like a stool with only two legs," Dagres said.

Van Nice said the switches will be compatible with carrier signalling formats, letting users build ATM nets with leased lines. One of the new switches is being used in conjunction with switches from Fore Systems and Newbridge Networks as part of the Earth Data System project conducted by the National Information Infrastructure Testbed.

Nicholas Testi, a senior member of the technical staff at Sandia National Laboratories in Albuquerque, N.M., who is involved with that project, said the switch interoperates well with the other vendors' equipment because it is based on international standards.

"The SynOptics switches provide us with a path into the RBOC world because the public providers are heading in the same SONET direction," Testi said. He was also pleased with the scalability and speed the new switches promise to offer.

In addition to the new switch models, SynOptics also rolled out a new workstation adapter card that supports the SONET/SDH interface. The SONET/SDH 155M bit/sec ATM SBus Adapter will occupy a single SBus slot in Sun Microsystems, Inc.'s SPARCstation 2 and 10 workstations. The card is expected to be available in the first quarter. Pricing will be determined at that time.

The company will also upgrade the current network management application for LattisCell to support its new switches. That application currently runs on the SunConnect SunNet Manager platform.

©SynOptics: (408) 988-2400.

SynOptics' new LattisCell ATM switches

Model	Interfaces and media supported	Price	Availability
10114	16 multimode fiber SONET/SDH ports	$35,950	Now
10114-SM	14 multimode fiber SONET/SDH ports, 2 single-mode fiber SONET/SDH ports	TBA	Q1 1994
10114-DS3	14 multimode fiber SONET/SDH ports, 2 coaxial cable T-3 ports	TBA	Q1 1994
10115	12 Category 5 unshielded twisted-pair SONET/SDH ports, 4 multimode fiber SONET/SDH ports	Less than $28,000	Q1 1994
10124-S	12 multimode fiber 100M bit/sec ports, 4 multimode fiber SONET/SDH ports	TBA	TBA

ATM = Asynchronous Transfer Mode
SDH = Synchronous Digital Hierarchy
SONET = Synchronous Optical Network
TBA = To be announced

SOURCE: SYNOPTICS COMMUNICATIONS, INC., SANTA CLARA, CALIF.
GRAPHIC BY SUSAN J. CHAMPENY

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NWR6

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1 Industry: (check one only)

01. ☐ Manufacturers (other than Computer/Communications)
02. ☐ Finance/Banking
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04. ☐ Real Estate
05. ☐ Healthcare Services
06. ☐ Legal
07. ☐ Hospitality
08. ☐ Retail/Wholesale Trade/Business Services
09. ☐ Transportation
10. ☐ Utilities
11. ☐ Education
12. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
13. ☐ Government, State/Local
14. ☐ Government, Federal
15. ☐ Military
16. ☐ Aerospace
17. ☐ Consultants (Independent)
18. ☐ Carriers
19. ☐ Interconnects
20. ☐ Manufacturers (Computer/Communications)
21. ☐ VAR/VAD/VAN/ Systems Houses
22. ☐ Distributors, Computer Related
23. ☐ Distributors, Communications Related
24. ☐ Other________________________________

2 What is your job function? (check one only)

NETWORKING MANAGEMENT
1. ☐ Networking Mgmt. 3. ☐ Datacom/Telecom Mgmt.
2. ☐ LAN Mgmt. 4. ☐ Engineering Mgmt.

MIS MANAGEMENT
5. ☐ MIS, IS, IT Mgmt. 6. ☐ Engineering Mgmt.

CORPORATE MANAGEMENT
7. ☐ Corporate Mgmt. (CIO, CEO, Pres., VP, Dir., Mgr., Financial Mgmt.)

8. ☐ Consultant (Independent)

9. ☐ Other________________________________

3 My responsibilities include: (check one only)

1. ☐ LANs/ Internetworking/ WANs 3. ☐ LANs 5. ☐ None
2. ☐ LANs/ Internetworking 4. ☐ WANs

4 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+ 3. ☐ 20 - 49 5. ☐ 2 - 9. 7. ☐ None
2. ☐ 50 - 99 4. ☐ 10 - 19 6. ☐ 1

5 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. Scope (check one only)	B. Involvement (check all that apply)
1. ☐ Corporatewide	1. ☐ Recommend/Specify
2. ☐ Multienterprise (consultants)	2. ☐ Approve
3. ☐ Departmental	3. ☐ Evaluate

4. ☐ None (A or B)

6 Check all that apply in Columns A and B:

A: I am involved in the purchase of the following products/services.
B: I plan to purchase the following products/services in the next year.

Involved / Plan to Purchase

A B LOCAL-AREA NETWORKS
☐ 01. ☐ Local-Area Networks
☐ 02. ☐ LAN Servers
☐ 03. ☐ LAN Operating Systems Software
☐ 04. ☐ Superservers
☐ 05. ☐ Data Base Servers (Oracle, Sybase, etc).
☐ 06. ☐ Terminal Servers
☐ 07. ☐ LAN Services
☐ 08. ☐ LAN Storage Devices (optical, tape, disk, etc,. including backup systems)
☐ 09. ☐ Network Test Equipment
☐ 10. ☐ Hubs
☐ 11. ☐ Cables, Connectors, Baluns
☐ 12. ☐ UPS
☐ 13. ☐ Network Adapter Boards
☐ 14. ☐ Peer-to-Peer LANs
☐ 15. ☐ Wireless LANs
☐ 16. ☐ SNMP Network Management
☐ 17. ☐ ATM (Asynchronous Transfer Mode)

A B INTERNETWORKING
☐ 18. ☐ Bridges
☐ 19. ☐ Routers
☐ 20. ☐ Gateways
☐ 21. ☐ Bridge/Routers
☐ 22. ☐ Hubs
☐ 23. ☐ Intelligent Hubs
☐ 24. ☐ Communications Servers

Involved / Plan to Purchase

A B COMPUTERS/PERIPHERALS
☐ 25. ☐ Micros/PCs
☐ 26. ☐ Minis
☐ 27. ☐ Mainframes
☐ 28. ☐ Pen-Based
☐ 29. ☐ Laptops
☐ 30. ☐ Workstations
☐ 31. ☐ Image Processing Workstations
☐ 32. ☐ Front-End Processors
☐ 33. ☐ Terminals
☐ 34. ☐ Printers
☐ 35. ☐ Cluster Controllers
☐ 36. ☐ Fax Machines
☐ 37. ☐ X-Terminals

A B SOFTWARE/APPLICATIONS
☐ 38. ☐ Network Management
☐ 39. ☐ Micro to Mainframe
☐ 40. ☐ Security
☐ 41. ☐ Communication/Terminal Emulation
☐ 42. ☐ Word Processing
☐ 43. ☐ Operating Systems
☐ 44. ☐ Business Applications (Finance/Mfg/HR)
☐ 45. ☐ Applications Development
☐ 46. ☐ Data Base Management
☐ 47. ☐ Spreadsheet
☐ 48. ☐ Groupware
☐ 49. ☐ EDI
☐ 50. ☐ E-Mail
☐ 51. ☐ Windows/Graphical User Interface
☐ 52. ☐ 4GL/Development
☐ 53. ☐ Multimedia
☐ 54. ☐ Graphics
☐ 55. ☐ Utilities

A B WIDE-AREA NETWORK EQUIPMENT/SERVICES
☐ 56. ☐ Modems (9.6K bps and over)
☐ 57. ☐ Modems (under 9.6K bps)
☐ 58. ☐ T-1
☐ 59. ☐ T-3
☐ 60. ☐ Fractional T-1
☐ 61. ☐ Data Switches
☐ 62. ☐ SMDS
☐ 63. ☐ ATM (Asynchronous Transfer Mode)
☐ 64. ☐ Matrix Switches
☐ 65. ☐ Packet Switches
☐ 66. ☐ Protocol Converters
☐ 67. ☐ Diagnostic/Test Equipment
☐ 68. ☐ DSU/CSUs
☐ 69. ☐ Microwave
☐ 70. ☐ Fax Boards/Modems
☐ 71. ☐ VSAT
☐ 72. ☐ Fiber Optic
☐ 73. ☐ Satellite
☐ 74. ☐ ISDN
☐ 75. ☐ PBXs (over 1000 lines)
☐ 76. ☐ PBXs (under 1000 lines)
☐ 77. ☐ Automatic Call Distributors
☐ 78. ☐ Voice Messaging Systems
☐ 79. ☐ Videoconferencing Systems
☐ 80. ☐ Voice Response/Processing
☐ 81. ☐ Switched Voice
☐ 82. ☐ Dedicated Leased Line
☐ 83. ☐ Switched Data
☐ 84. ☐ Centrex
☐ 85. ☐ E-Mail/On-Line Information
☐ 86. ☐ Image Processing
☐ 87. ☐ Audio Teleconferencing
☐ 88. ☐ Local Services
☐ 89. ☐ WATS MTs
☐ 90. ☐ International
☐ 91. ☐ Virtual Networks
☐ 92. ☐ Frame Relay
☐ 93. ☐ Value Added Services
☐ XX ☐ None of the above (1-93)

7 What is the total number of A: LANs B: Workstations/Nodes in your entire organization?

	A LANs		B Workstations/ Nodes
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	9 or Less	☐

8 Which of the following network platforms are currently installed/planned in the next year?

NETWORK ARCHITECTURES
Present Planned
☐ 01. ☐ SNA
☐ 02. ☐ DECNET
☐ 03. ☐ MAP/TOP
☐ 04. ☐ TCP/IP
☐ 05. ☐ DCA (Unisys)
☐ 06. ☐ X.25

Present Planned
☐ 07. ☐ NOVELL IPX/SPX
☐ 08. ☐ APPC/APPN/LU 6.2
☐ 09. ☐ NETBIOS
☐ 10. ☐ OSI
☐ 11. ☐ APPLETALK
☐ 12. ☐ OTHER________________________

LAN OPERATING SYSTEM
☐ 13. ☐ LOCALTALK (APPLETALK)
☐ 14. ☐ BANYAN (VINES)
☐ 15. ☐ DCA (IRMALAN)
☐ 16. ☐ DCA (10-NET)
☐ 17. ☐ IBM (LAN SERVER)
☐ 18. ☐ IBM (PC LAN PROGRAM)
☐ 19. ☐ MICROSOFT (LAN MANAGER)
☐ 20. ☐ UNGERMANN-BASS (NET/1)
☐ 21. ☐ NOVELL (NETWARE, 2.X, 3.X, 4.X)
☐ 22. ☐ PROTEON (PRONET)
☐ 23. ☐ SITKA (TOPS)
☐ 24. ☐ 3COM (3+, 3+OPEN)
☐ 25. ☐ ARTISOFT (LANTASTIC)
☐ 26. ☐ HAYES (LANSTEP)
☐ 27. ☐ DEC (PATHWORKS)
☐ 28. ☐ OTHER________________________

LAN ENVIRONMENT
☐ 29. ☐ 4M TOKEN RING
☐ 30. ☐ 16M TOKEN RING
☐ 31. ☐ ARCNET
☐ 32. ☐ ETHERNET
☐ 33. ☐ STARLAN
☐ 34. ☐ FDDI
☐ 35. ☐ LOCALTALK
☐ 36. ☐ 10BASE-T
☐ 37. ☐ OTHER________________________

OPERATING SYSTEM
☐ 38. ☐ DOS
☐ 39. ☐ UNIX/XENIX/AIX
☐ 40. ☐ OS/2
☐ 41. ☐ OS/2 2.X
☐ 42. ☐ MVS
☐ 43. ☐ VM
☐ 44. ☐ VMS
☐ 45. ☐ MACINTOSH
☐ 46. ☐ WINDOWS
N/A 47. ☐ WINDOWS NT
☐ 48. ☐ X WINDOWS
☐ 49. ☐ OTHER________________________

9 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

1. ☐ Europe 4. ☐ Australia
2. ☐ Asia 5. ☐ Middle East
3. ☐ South America 6. ☐ None

10 Which of the following hardware platforms is installed/planned in your company? (check all that apply)

	Mainframes Currently Installed	Planned Next Year	Minis Currently Installed	Planned Next Year
01. DEC	☐	☐	☐	☐
02. IBM	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐
04. AT&T	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐
06. DATA GENERAL	☐	☐	☐	☐
07. HP	☐	☐	☐	☐
08. TANDEM	☐	☐	☐	☐
09. UNISYS	☐	☐	☐	☐
10. OTHER______________	☐	☐	☐	☐

MICROCOMPUTERS
(fill in the numbers)

	NUMBER INSTALLED	NUMBER PLANNED NEXT YEAR
11. MACINTOSH 20, 30, 40		
12. MACINTOSH OTHER		
13. PCs BASED ON 80586	N/A	
14. PCs BASED ON 80486		
15. PCs BASED ON 80386		
16. PCs BASED ON 80286		
17. PCs BASED ON 8086/8088		
18. RISC / UNIX BASED WKSTNS		
19. OTHER		

11 Estimated value of networking equipment and services:

A. Which you helped specify, recommended or approved in the last year?
B. Which you plan to help specify, recommend or approve in the next year?

A B
☐ 1. ☐ $100 million and over
☐ 2. ☐ $50 - $99.9 million
☐ 3. ☐ $25 - $49.9 million
☐ 4. ☐ $20 - $24.9 million
☐ 5. ☐ $10 - $19.9 million
☐ 6. ☐ $5 - $9.9 million
☐ 7. ☐ $1 - $4.9 million
☐ 8. ☐ $500,000 - $999,999
☐ 9. ☐ $499,999 or less

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ Over $10 billion 5. ☐ $50 to $99.9 million
2. ☐ $1 to $9.9 billion 6. ☐ $10 to $49.9 million
3. ☐ $500 to $999.9 million 7. ☐ $5 to $9.9 million
4. ☐ $100 to $499.9 million 8. ☐ $4.9 million or less

13 Estimated number of employees for your entire corporation:

1. ☐ Over 10,000 4. ☐ 1,000 - 2,499
2. ☐ 5,000 - 9,999 5. ☐ 500 - 999
3. ☐ 2,500 - 4,999 6. ☐ 499 or less

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BILLING ISSUES

Sprint launches new version of customer invoicing system

BY BOB WALLACE

Kansas City, Mo.

Sprint Corp. last week announced a new version of its personal computer-based invoicing system, which enables users to more quickly and easily process billing data for the full array of the carrier's net services.

Fonview 4.2 will be provided to all customers on floppy disk or CDROM next month. The package works on a PC with an Intel Corp. 80286 or higher processor and at least 520K bytes of random-access memory.

With Fonview 4.2, Sprint becomes the first of the Big Three to offer an invoicing system that covers private-line services. It lets net managers sort through call data, calculate the cost per minute of service and prepare bills for internal billback.

"This puts Sprint's Fonview ahead of systems from AT&T and MCI by covering more services and offering the easiest to use features," said Chris Finn, a senior analyst at TeleChoice, Inc., a Verona, N.J., consultancy.

Another differentiator is AT&T and MCI Communications Corp. require users to buy sometimes-dissimilar, service-specific systems, which makes managing calling costs tougher and more expensive, he added.

Robin Lloyed, Sprint's group manager for invoice product marketing, said net managers can inventory private lines by assigning a number to each link, along with information about such things as access lines and attached equipment.

Room with a Fonview

Services covered under Sprint's Fonview 4.2 invoicing system:

- ☐ * Clearline private lines
- ☐ 800
- ☐ WATS
- ☐ Virtual Private Network
- ☐ International voice

*Supported only under new version.

SOURCE: SPRINT CORP., KANSAS CITY, MO.
GRAPHIC BY TERRI MITCHELL

"We're considering using [the new version] to manage everything we have with Sprint," said Mike Doughty, manager of networking support for Occidental Petroleum in Tulsa, Okla. "The private-line support is important because we bill about $1.2 million a year in private lines."

Doughty said he expects the new version of Fonview to be of interest to members of Sprint's Business Users Association, of which Occidental Petroleum is a member. "I expect users will be making a decision to use it in the next few weeks," he added.

PREINDEXED INFORMATION

Fonview 4.2 and AT&T's Billing Edge offer preindexed information, such as a list of longest duration calls, which can be accessed quickly. MCI's Portfolio system has to search through call records to collect that data.

The new version of the Sprint invoicing system is also faster than competing systems when it comes to generating marked-up bills for billback, Finn said. It enables net managers to create client profiles, which serve as a billing framework to which calling charges are added in order to complete monthly bills for employees, departments or business units, Lloyed said.

In the past, net managers could use Fonview to perform a fixed calculation to determine their gross cost per minute. That calculation covered usage charges and nonusage charges including feature fees, promotions, discounts and taxes.

With Fonview 4.2, net managers can tweak the cost-per-minute equation in a variety of ways.

"Most users say they want to drop nonusage fees but keep promotions and discounts when calculating their net [cost per minute]," Lloyed said. According to Finn, this is easier said than done with competing systems.

The new version of Fonview will also sport a reporting feature, which provides the city and state from which each call was made, as well as the total number of calls, minutes and charges associated with each Sprint 800 number.

Sprint customers will receive Fonview 4.2 at no charge, but they must pay for the monthly floppy disk or CDROM that contains the call data. Sprint will offer a master package that includes call detail information for all services at all sites for $250 per month with a onetime $50 fee.

The carrier can also provide a pack for all services per site for $100 a month with the same onetime fee. Z

Lotus issues new releases of Notes imaging software

Firm also cuts prices in effort to boost sales.

BY ADAM GAFFIN

Cambridge, Mass.

Lotus Development Corp. last week announced a new version of its imaging software for Notes and slashed the price by two-thirds to try to spur sales of the product and related offerings.

Lotus Notes: Document Imaging (LNDI) Image Viewer lets users of the Notes groupware package exchange and manipulate images. Version 2.0 adds tools for image manipulation, support for more scanners and an easier-to-use interface.

Lotus also rolled out version 2.0 of its LNDI Image Mass Storage Subsystem for managing large image databases. The new version lets users manage image storage across a network.

Both new releases are available now.

The new version of Image Viewer lets users import gray-scale and color images, as well as GIF and BMP images, according to Scott Cooper, a Lotus product manager. It previously supported black-and-white images and a more limited range of image formats.

The software now lets users take advantage of any unique image-processing techniques their scanners might use, Cooper said.

The software, which resides on a client workstation, was redesigned to add support for additional scanners and other imaging devices, such as Eastman Kodak Co.'s Photo CD and digital cameras, Cooper said. The software now lets users take advantage of any unique image-processing techniques their scanners might use, he said.

Based on user feedback on the first version of the software, released in September of last year, Lotus redesigned the user interface. The new interface lets users retrieve images by clicking on either an icon or a thumbnail-sized version of the image.

The software also now supports Microsoft Corp.'s Object Linking and Embedding 1.0 technology, which lets users exchange images between different Windows-based applications, Cooper said.

In an effort to make the product even more attractive, Lotus cut the price from $295 to $99 per user.

Cooper said sales of the initial release "went pretty well" but not as well as the company had hoped.

Notes itself only began to take off "when somebody bought 30,000 copies of it," Cooper said. Lotus hopes the price cut will lead to similar large testimonial accounts for the image viewer and related systems, he said.

To date, sales of the software have been in the 50-to-100 unit range per user organization, but Cooper expects there is a pent-up demand for enterprise imaging systems as well. Cooper said Lotus recently won a contract from one company, which he declined to name, for several thousand copies of the software.

Existing users of the imaging software with maintenance agreements can upgrade to the new software for free. Others can upgrade for $10.

The Image Mass Storage Subsystem, which runs on OS/2 workstations, lets users determine how images migrate from one storage medium to another. This lets users keep frequently used images on hard drives, while automatically shifting less commonly-used images to cheaper systems, such as optical jukeboxes or tap drives. The software costs $3,000.

Lotus's Document Imaging product line, developed with Eastman Kodak, also includes incoming and outgoing facsimile gateways and an optical-character reader server.

©Lotus: (800) 346-1305.

Reach to work with Lotus and Novell

BY ADAM GAFFIN

Sunnyvale, Calif.

Reach Software, Inc. will soon release a version of its WorkMan work flow software for Lotus Development Corp.'s Notes and will work with Novell, Inc. to bundle WorkMan development tools with Novell's AppWare system.

The Notes version of WorkMan will let users set up automatic routing systems and work flow applications using forms, such as purchase orders, created from Notes databases. Integration of the WorkMan development tools with AppWare will help NetWare users develop work flow applications.

WorkMan for Notes, expected to ship in the first quarter of 1994, will have enhanced features not found in the current stand-alone version of WorkMan, including a visual tool for charting the paths a document will take through a network.

The company plans a new release of the stand-alone version at the same time but declined comment on its features. The current version of WorkMan, 1.0, was released in March.

JAGANNATHAN

WorkMan's Notes software has two parts, according to Reach Chairman Anand Jagannathan. WorkMan sits on client computers, letting users launch documents, purchase orders and other forms through an organization via any of several electronic mail systems supported by the software: Notes Mail, cc:Mail, NetWare MHS and VINES.

WorkMap is a program that lets systems managers examine and create the paths these files will follow, as well as decide who can read and edit which documents. WorkMap uses Notes databases to create an on-screen flow chart for work flow applications that a manager can then modify through a point-and-click interface.

An audit trail lets users and administrators track a document as it filters through the organization.

Jagannathan said WorkMan gives Notes administrators an extra level of security because it lets them decide who can read and edit particular documents without having to write complex macros.

Heidi Dix, an analyst with Forrester Research, Inc. in Cambridge, Mass., said she was impressed with the program's integration with Notes and Reach's efforts to integrate the program engine with other applications. The company says it is working to extend the program to work with such programs as SQL databases and spreadsheets.

"It makes a lot of sense," she said. "Work flow in and of itself is not really a market."

Novell's decision to bundle WorkMan tools with its Visual AppBuilder network development system — expected to ship in mid-1994 — will prove a boon for Reach in its competition with rivals such as Action Technologies, Inc., according to one analyst.

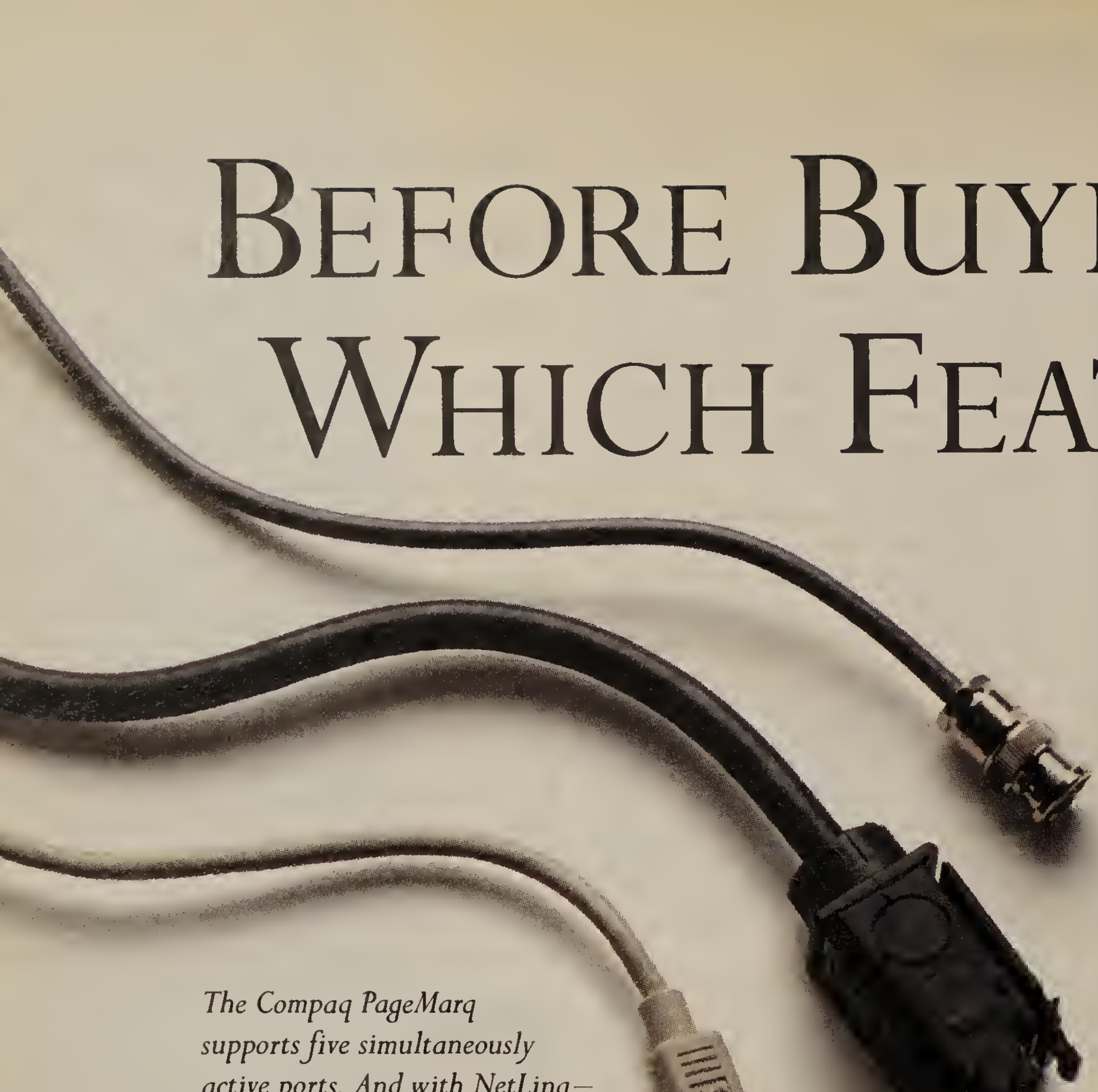
WorkMan will be bundled with AppWare as an object-oriented AppWare Loadable Module, which will let developers create work flow applications for use across Novell networks.

WorkMan, which relies on an underlying E-mail system to route forms, does not support Microsoft Corp.'s Microsoft Mail, the second most widely used local-area network-based mail package. However, a company spokeswoman said the firm hopes to announce support in the first quarter of next year.

A two-person license for WorkMan for Notes will retail for $395. A five-person license will sell for $795. The bundled AppWare tools will come with a three-user license.

©Reach: (415) 733-8685.

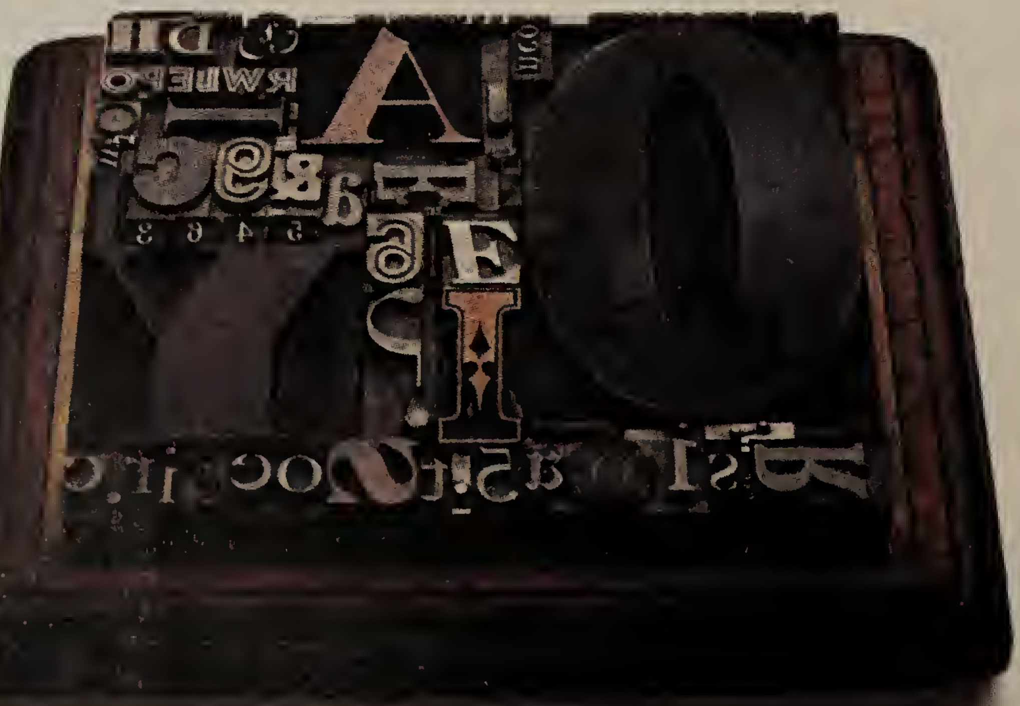
BEFORE BUYING SOMEONE
WHICH FEATURES YOU'RE

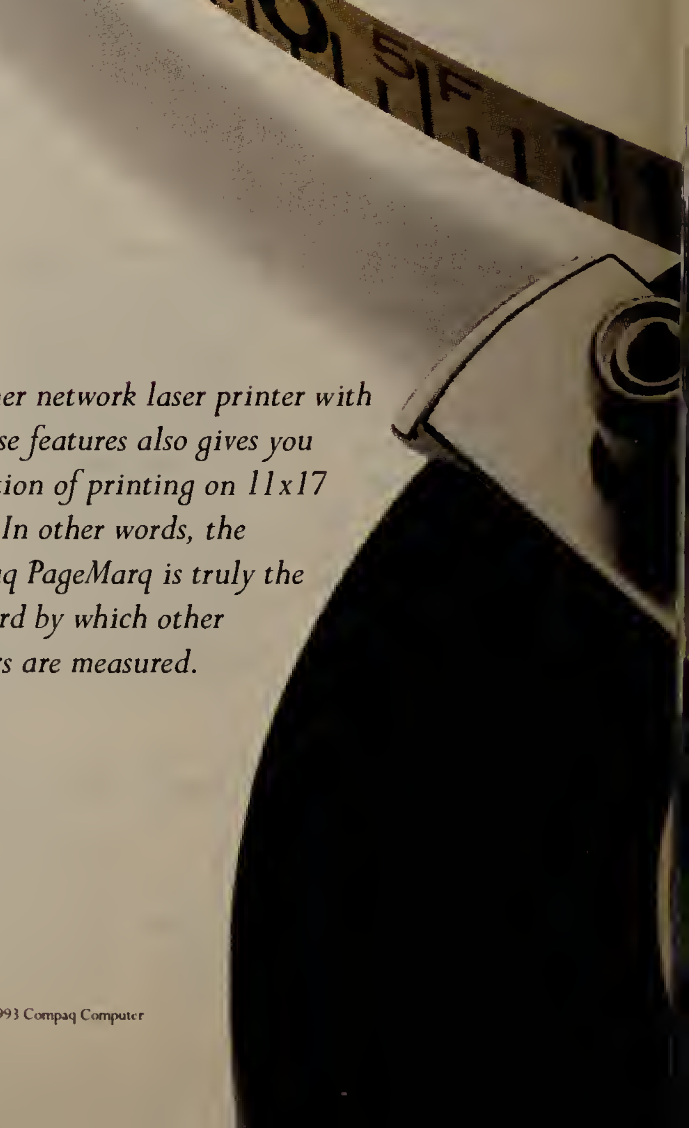


The Compaq PageMarq supports five simultaneously active ports. And with NetLinq—a host of direct connectivity options—it can be customized to take care of even the most complicated office environments.

It may be hard to imagine the world before fax machines, but it's not hard to imagine a world where they're no longer necessary. With PageMarq's internal fax modem, you can send and receive genuine Adobe PostScript documents in sizes up to 11x17.

(Not easy to cross one out, is it?)





No other network laser printer with all these features also gives you the option of printing on 11x17 paper. In other words, the Compaq PageMarq is truly the standard by which other printers are measured.

The most important type development since Gutenberg? 1- and 2-MB Programmable Font Modules (or an optional, internal 60-MB Hard Drive) let you customize your fonts. And all are stored permanently, eliminating the need to constantly download.

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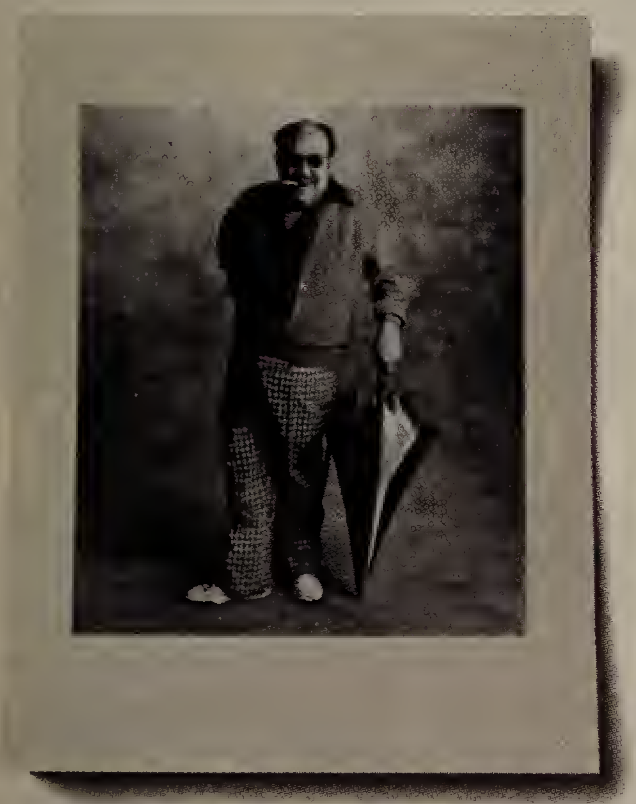
ELSE'S PRINTER, DECIDE WILLING TO GIVE UP.



The Compaq PageMarq High-Resolution mode prints with such extraordinary clarity it can improve just about anybody's image. (Well, almost.) At the very least, 800 x 400 dpi resolution ensures razor-sharp text and super-crisp graphics so that all your reports and presentations come out looking their best.

When it comes to paper capacity and performance, the PageMarq 20 stacks up quite nicely. It prints at 20 ppm, and so you don't have to constantly refill the paper tray to keep up, it holds 1500 sheets.

Unless you enjoy denying yourself, choosing a network laser printer that doesn't have everything you need just doesn't make sense. Which is why the more you shop and compare, the more one printer becomes the clear choice. The Compaq PageMarq.

In short, no other network laser printer offers the same high-performance features and rugged quality at anywhere near the same price. And to make sure you also get everything you need by way of support, PageMarq includes a one-year, on-site warranty* and free technical help 7 days a week, 24 hours a day for as long as you own the printer.

For more details, call us at 1-800-345-1518. (For complete model information, just select the PaqFax option.) After you've compared the Compaq PageMarq to other printers, you'll realize there's only one thing you have to give up. The notion of settling for anything less.

COMPAQ

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Circle Reader Service #8

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ENTERPRISE INTERNETS

Data Network Architectures, Standards, Equipment and Management

NETWORK MANAGEMENT

NCR integrates third-party applications with StarSentry

BY JIM DUFFY

Dayton, Ohio

NCR Corp. last week announced agreements with four network management software vendors to integrate their applications into its StarSentry network and systems management platform.

The applications are intended to improve StarSentry's ability to manage Novell, Inc. NetWare local-area networks, non-Simple Network Management Protocol (SNMP) devices and remote Ethernet LAN segments while also providing improved network asset and configuration management capabilities.

StarSentry, which is based on NetLabs, Inc.'s NetLabs Manager, runs on Unix servers and can be configured as a centralized management console or as a distributed network domain manager. It includes NCR and third-party applications that support software distribution and enable the system to manage Unix, DOS and OS/2 clients, LAN servers and hubs, bridges, routers and wide-area links.

NCR's agreements are with Peregrine Systems, Inc., Bridgeway Corp., Network Application Technology, Inc. (NAT) and Isicad, Inc. Applications from these vendors will be integrated with StarSentry at the menu and event levels, meaning they can be launched from the StarSentry menu via a mouse click, and event data they gather can be logged in the system's event manager.

Peregrine's ServerView and StationView applications manage NetWare servers and clients, respectively, and automatically discover servers and clients on managed networks.

ServerView allows StarSentry operators to add and delete users, disengage and reboot servers, change passwords, modify access rights, load and unload NetWare Loadable Modules, broadcast messages and perform remote console commands. ServerView also monitors server CPU and memory usage.

StationView provides StarSentry users with local and network disk usage information, adapter and connection data, and printer availability and queue status.

ServerView and StationView for StarSentry will be available in the second quarter of 1994. Pricing for both products ranges from $6,750 to $7,750 for the manager license and $350 to $550 for the server agent license.

Meanwhile, Bridgeway's EventIX application will allow users to integrate event and alarm information from any legacy or proprietary system into the StarSentry console.

EventIX includes customizable interfaces to various non-SNMP management systems, including IBM's NetView. It also includes SNMP proxy agent software that acts as a gateway between SNMP and non-SNMP management environments.

EventIX automatically recognizes when a user-defined event occurs. It then initiates the appropriate action based on predefined rules.

Pricing and availability of EventIX on StarSentry has not yet been determined.

For Ethernet segment monitoring, StarSentry can now run Network Application Technology's Multi-Vendor Support Series (MVSS) application. MVSS processes and interprets LAN diagnostic data retrieved from NAT's EtherMeter LAN probe.

MVSS will allow StarSentry users to diagnose LAN problems, determine performance, facilitate traffic management, and help administrators gauge network capacity. MVSS can also detect duplicate Internet Protocol addresses.

MVSS for StarSentry will be available in the first quarter of 1994 for $1,995. EtherMeter probes are priced from $1,495 to $2,895.

Lastly, for net asset and configuration information monitoring, Isicad's Command 5000 application can now be launched from the StarSentry platform.

When a fault is detected, StarSentry operators can access relevant device information from the Command 5000 database, including the technical characteristics of the device, its physical connections and its location.

This information can also be used to populate Remedy Corp. trouble tickets launched by the StarSentry system. NCR and Remedy recently announced integration of Remedy's Action Request System with StarSentry.

Pricing and availability of Command 5000 on StarSentry has not yet been determined.

©NCR: (513) 445-5000.

New applications for NCR's StarSentry

Peregrine Systems, Inc.

ServerView/StarSentry and StationView/StarSentry manage NetWare servers and clients, respectively.

Bridgeway Corp.

EventIX provides access to proprietary, non-SNMP systems.

Network Application Technology, Inc.

Multi-Vendor Support Series application provides interpretation of data collected by NAT's EtherMeter RMON LAN probe.

Isicad, Inc.

Command 5000 provides network asset and configuration information.

SOURCE: NCR CORP., DAYTON, OHIO
GRAPHIC BY SUSAN J. CHAMPENY

BRIEFS

Micom Communications Corp. last week announced a new product that allows telecommuters to communicate with a host site more efficiently over dial-up or leased-line connections.

The vendor's new Sprinter Network Server is designed to send data from stand-alone personal computers simultaneously with voice or facsimile traffic. For instance, a telecommuter can utilize the Sprinter to access a corporate Private Branch Exchange while at the same time the user's PC is on-line to the corporate LAN or host computer system, effectively doubling the usage of the connection.

Sprinter costs $1,450 and is available now.

Micom: (805) 583-8600.

Wellfleet Communications, Inc., Fore Systems, Inc. and **Digital Link** have built an ATM backbone network for SCinet, the high-speed local- and wide-area network at the Supercomputing '93 Conference.

The SCinet backbone comprises of Wellfleet routers connected to Fore Systems' ASX-100 Asychronous Transfer Mode (ATM) switches through Digital Link 3200 data service unit/channel service unit supporting Wellfleet's ATM-DXI interface.

SCinet supports a range of supercomputing demonstrations, applications and network services running on Ethernet, Fiber Distributed Data Interface, ATM, Synchronous Optical Network, High-Performance Parallel Interface and Fibre Channel networks.

Pacific Communication Sciences, Inc. (PCSI), a subsidiary of **Cirrus Logic, Inc.,** will release a software developer's kit for its new cellular digital packet data (CDPD) products in the first quarter of 1994.

The kit will let developers write applications for its Ubiquity line of communications devices that can connect computers over cellular packet networks.

The kit includes a CDPD network simulator and a library of standard communications application program interfaces, such as Windows Sockets, as well as Transmission Control Protocol/Internet Protocol and DOS systems for computers with limited memory.

The kit will sell for $995.

PCSI: (619) 535-9500.

Certification programs reduce staffing guesswork

BY MAUREEN MOLLOY

Choosing the right person to manage a corporate multivendor network is no small task. According to some users, a dearth of available expertise, coupled with only vague assurances that any given candidate will fit the bill, makes it a daunting project.

To combat this user insecurity when evaluating existing personnel or potential hires, a number of certification programs have proliferated over the past two years that aim to provide users with a benchmark to use when hiring technical staff or outsourcing technical services.

"Today it's very much a crapshoot. The user's best option is to get referrals from other users that have similar networking requirements," said Karl Dakin, an attorney in Boulder, Colo., who specializes in computer software and hardware certification issues. "Standards will eventually come into place that will let users more quickly and easily determine if a [technician] is capable."

The primary organizations working toward the development of such standards include the National Association of Communications Systems Engineers (NACSE), the Institute for Certification of Computer Professionals and the Certified Network Expert organization.

Each has established programs to make it easier for users to assess network staffers' skills.

In addition, vendors such as Banyan Systems, Inc., Microsoft Corp. and Novell, Inc. have developed their own product-specific certification programs.

While a significant boost over the word-of-mouth referrals users relied on in the past, even a certified technician will not always spell success, according to some users.

Hartford, Conn.-based Travelers Insurance Co. once hired a certified professional who was nonetheless ineffective.

"The person knew conceptually what we were doing and trying to achieve, but when it came time to sit down and do hands-on work with our network, the person wasn't very useful," said Jim Oleksiw, Travelers' telecommunications director.

Mitch DeWaters, a systems specialist and local-area network manager at Eastman Kodak Co. in Rochester, N.Y., agreed. "It's still a case of 'buyer beware' when it comes to hiring networking professionals. Certification credentials are a good first step, but it's no guarantee you'll get the person you need," he said.

According to Bob Kile, president of Kile & Associates, Inc. and a founder of the newly formed NACSE, a key source of the problem is that many users mistakenly perceive technicians trained in a vendor-specific program as general networking experts. That is, many mistake a Novell Certified NetWare Engineer (CNE), for instance, as competent to handle wide-area network requirements — which may or may not be the case.

He cautioned users not to view vendor-specific programs as a blanket certification.

"What's happened is that users are getting burned because they hire a CNE when their network consists mainly of Banyan and Unix gear," Kile said. "Naturally, the CNE will be lost in that network."

DECnet/OSI helps addressing limitations

BY JIM DUFFY

Maynard, Mass.

Digital Equipment Corp. users bumping up against the addressing limitations of DECnet Phase IV might find a solution to their problems with DECnet/OSI.

DECnet/OSI, commonly referred to as DECnet Phase V, integrates DECnet Phase IV protocols with Open Systems Interconnection protocols in the same stack. It's intended to allow users to access DECnet and OSI applications using their choice of DECnet or OSI transport protocols, and foster a more interoperable network environment with non-DEC systems that also talk OSI.

DECnet/OSI also supports the OSI addressing scheme, which overcomes the limitations of DECnet Phase IV addressing.

DECnet Phase IV uses 16-bit addresses that contain area and node numbers. A DECnet area is analogous to a subnetwork, or net domain. DECnet Phase IV lets users construct networks of up to 63 areas with 1,023 nodes per area.

By contrast, a DECnet/OSI address, which is called a network service access point (NSAP), is 160 bits in length. With that much address space, DECnet/OSI configurations can support thousands of areas and millions of nodes.

An NSAP address has two parts: an initial domain part and a domain-specific part. The initial domain part identifies the administrative domain that a DECnet/OSI node belongs to. An administrative domain is a collection of end systems, routers and subnetworks operated by a single organization or administrative authority.

The domain-specific part defines a node's area address, the systems within that node's area and the destination DECnet/OSI node.

DECnet/OSI addressing allows users to create routing domains of 100,000 systems or more. But dividing these routing domains into smaller, separate DECnet/OSI areas reduces routing overhead, improves network performance and simplifies network management, according to DEC.

Another key addressing element of DECnet/OSI is automated end node addressing and naming. With DECnet/OSI, end nodes can determine and assign themselves address fields without manual intervention.

When a DECnet/OSI end node is attached to the network and its desired name is typed in, the system generates its address, locates the nearest DEC distributed name service (DECdns) server and registers itself — all without user intervention. The name server then distributes this new system's information to other name servers throughout the network.

DECdns servers also automatically update address tables with name-to-address mappings and changes. DECnet/OSI nodes can then peruse DECdns address tables to determine the address of nodes with which they want to communicate.

Addresses of nodes with which communications have already been established are stored in local cache memory. If an end node wishes to communicate with a node that's not in cache, the node can "ask" a DECdns server for the needed information. That information is then placed in the end node's cache for subsequent connection requests.

With DECnet Phase IV, each node in the network maintains its own database that maps names into addresses. To avoid duplicate names and addresses, a network administrator has to set up a central administration point for Phase IV node naming and addressing.

This central point houses a database of node name-to-address mappings and, unlike DECnet/OSI, distributes this information to all nodes in the network. ◼

IBM to sell workstation clustering switch to vendors

BY MICHAEL COONEY

White Plains, N.Y.

In its continuing effort to sow the seeds of its own networking technology throughout the industry, IBM has announced that it will sell its workstation clustering switch not only to users but also to interested vendors.

As many as 16 Personal System/2 or RISC System/6000 workstations can be attached to a single IBM Allnode Switch, which creates a virtual backplane between the workstations that has a scalable bandwidth of up to 15M byte/sec, IBM said. The clustered systems can be used to support high-speed parallel or distributed applications.

"Users can run large, distributed applications on these Allnode clusters and connect them over high-speed networks," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy based in Washington, D.C. "It's an alternative to running everything on a LAN."

Allnode currently supports Network Basic I/O Systems and Transmission Control Protocol/Internet Protocol communications protocols.

IBM laid out ambitious plans for the OEM world last year when executives said they expected the eight IBM business groups to produce $3 billion worth of OEM sales by the end of this year.

While every business group within IBM has its own OEM strategy, analysts said IBM's focus has been on getting its networking and software products to the OEM market. Since IBM connectivity and software solutions are the glue that holds many enterprises together, those businesses are under more pressure to succeed in selling their own products to other vendors.

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DOWNSIZING

Brixton turns HP workstations into mainframe alternatives

BY MICHAEL COONEY

Cambridge, Mass.

In an effort to help SNA users downsize applications to the Unix environment, Brixton Systems, Inc. has annnounced an agreement to port its SNA emulation software to Hewlett-Packard Co. Unix workstations.

Under terms of the agreement, Brixton will join HP's Channels Partner Program and offer its BrxPU5 virtual mainframe gateway on HP 9000 Series 700 and 800 workstations.

For users downsizing legacy systems, the BrxPU5 gateway will let Systems Network Architecture users simultaneously access new-generation Unix applications at the same time they access legacy applications.

"We are trying to help users who have applications on the mainframe but are interested in gradually moving some applications off the mainframe and onto a Unix platform," said Herb Rush, president of Brixton. "Users can consider this a tool to help them take the first steps in downsizing."

BrxPU5 is software that runs on HP 9000 Series 700 or 800 workstations. The software emulates a communications subset of an IBM mainframe, complete with System Services Control Point support, which handles device sessions, diagnostics and recovery.

With BrxPU5, users can run any mainframe application on the HP box and 3270 SNA users can communicate with it as if it were still on the mainframe. The number of users that can access the application is limited only by the memory and power of the HP box. If a client HP workstation contains a 3270 emulation package, it can access both the SNA application and any Unix applications on the box simultaneously.

"The HP 9000 Series 800 is touted as the 'mainframe alternative,' so we've seen the greatest demand there and it can typically handle over 1,000 users at a time," Rush said.

In joining HP's Channels Partner Program, Brixton will sell its Brx3270 and Brx5250 emulation packages to HP customers. It will also offer BrxOpenView, which is software that will allow the HP workstations running BrxPU5 to pass network management data, such as configuration and status information, to HP's OpenView or IBM's host-based NetView platform.

"Users will be able to manage their new Unix environments from their existing NetView platform or the HP OpenView solution; it'll be their choice."

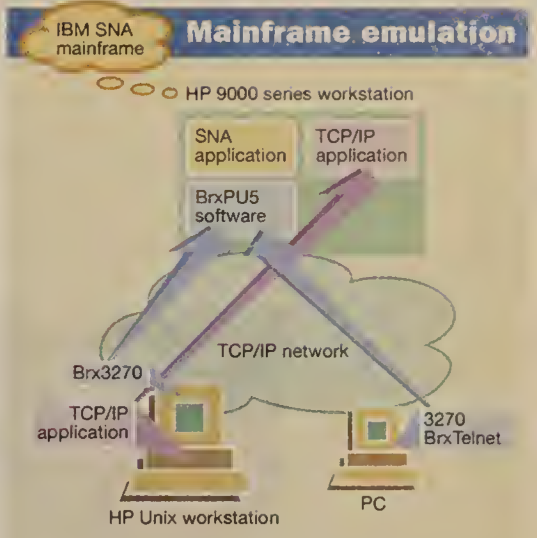
Analysts said the Brixton-HP alliance is a positive step for those users looking to test the downsizing waters.

"Companies such a Brixton, OpenConnect Systems and Apertus Technologies, Inc. have had great success partnering with the Unix workstation vendors to offer downsized SNA mainframe application packages," said Lucinda Santisario, research manager of computer networking architectures at the International Data Corp., a research firm in Framingham, Mass. "It's a good way for users to gain easy access to existing as well as new applications."

The BrxPU5 software for HP 9000 Series 700 and 800 machines is available at prices starting at $8,000.

©Brixton: (617) 661-6262

Mainframe emulation



Brixton Systems' BrxPU5 software will let mainframe applications run on Hewlett-Packard Co.'s HP 9000 workstations, enabling users to downsize SNA applications.

SOURCE: BRIXTON SYSTEMS, INC., CAMBRIDGE, MASS.
GRAPHIC BY TERRI MITCHELL

"This is just another example of how IBM wants to generate revenue," Dzubeck said. "If it's not nailed down, IBM will sell it."

IBM's Networking Systems group has been modestly successful, in IBM terms, by contributing about $1 million for OEM sales in 1992. There's no word on how it is doing this year.

Among the products it sells to other vendors are its 3270 terminals, 4M/16M bit/sec Token-Ring Adapters, the 3172 Interconnect Controller and 3174 Establishment Controller to other vendors.

By comparison, IBM's Enterprise Systems group is expected to generate $100 million in OEM business this year by selling Enterprise System/9000 mainframes and Enterprise System Connection (ESCON) Converters and ESCON Directors, which let a single device attach to multiple ESCON channels. IBM's Technology Products group, which deals primarily with semiconductors, contributed about $150 million in 1992.

IBM said its OEM strategy will help users by driving potential de facto IBM standards, such as its much vaunted Advanced Peer-to-Peer Networking Network Node technology into the marketplace quicker. It also helps by giving customers guaranteed IBM compatibility in third-party products.

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Comments

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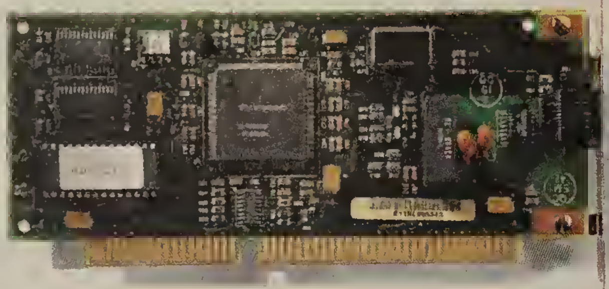
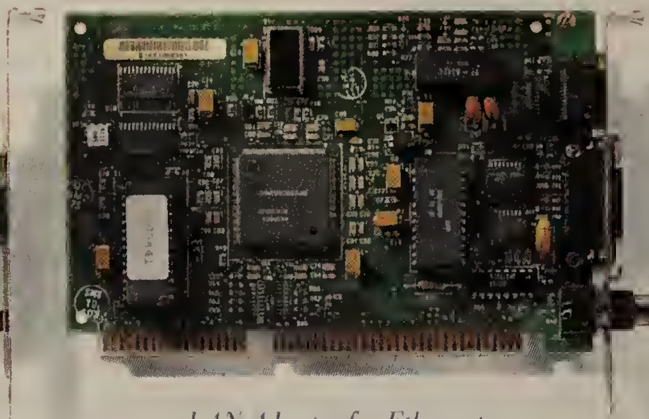


LAN Adapter for Ethernet TP (10BaseT, ISA)



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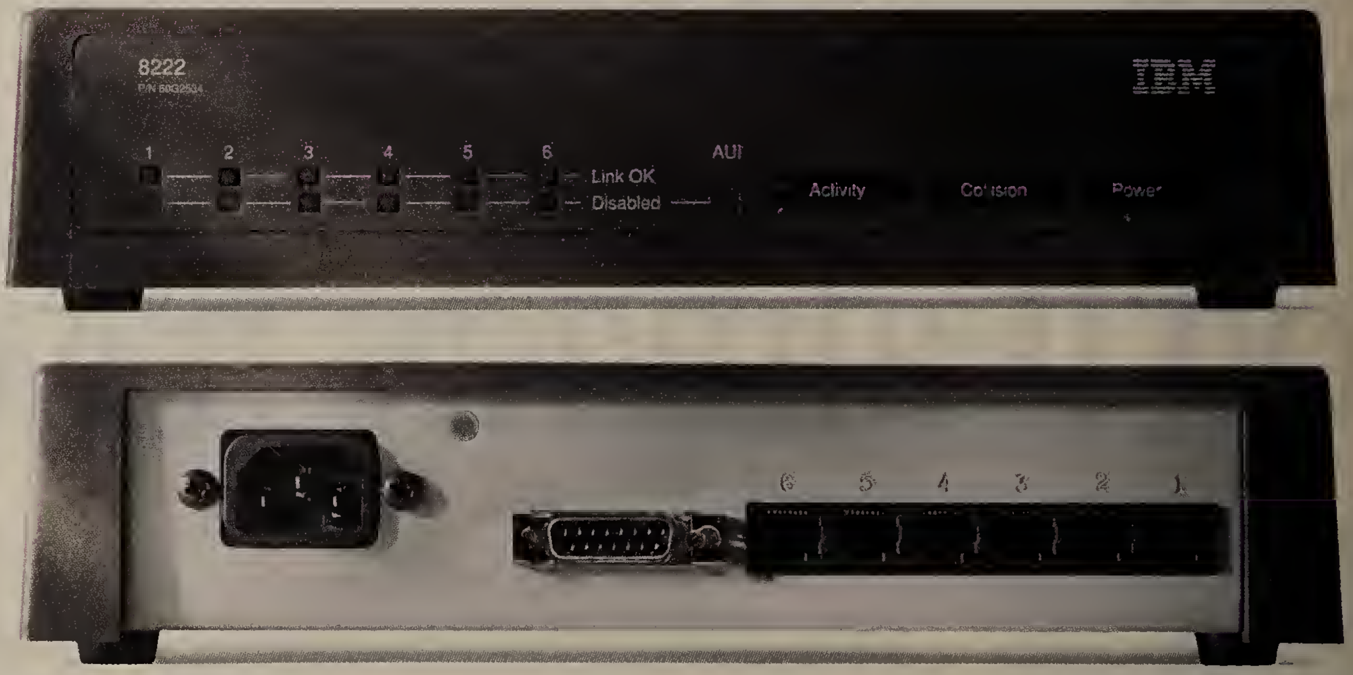
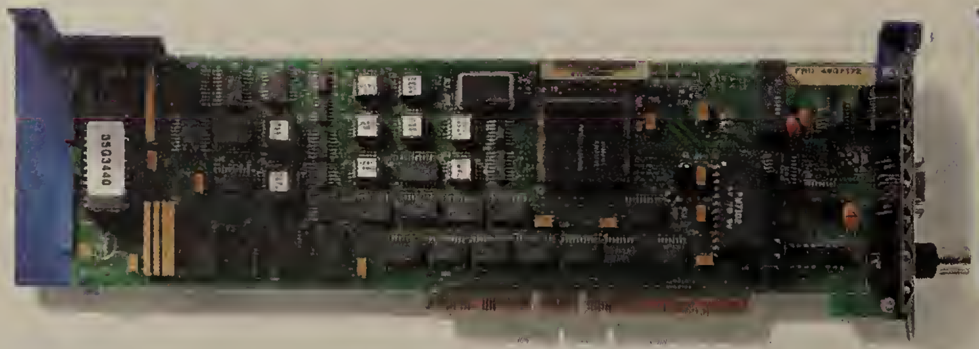


IBM 8222 6-Port 10BaseT Workgroup Hub (AUI port cascades for added connectivity, LED diagnostics, full 802.3 compliance)



LAN Adapter/A for Ethernet (10BaseT/2/5, MCA)

EtherStreamer MC 32 Adapter (10BaseT/2/5, full duplex mode)

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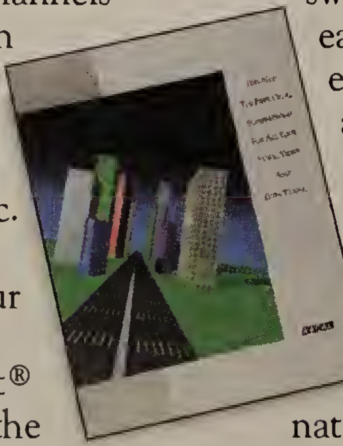

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Circle Reader Service #10

NET RESULTS

by Mark Gibbs

The fight against PC-ism

Back in September, I wrote a column titled "Network Fascists Taking Control." Since then, I have received letters from a group of readers who face the unpleasant reality of being treated as second-class network citizens in their organizations. This discrimination is not about race or color, but rather it has to do with the PC they want to use.

These victims of prejudice are Macintosh users. They are victims of PC-ism.

Most of these people are not computer buffs. They don't want to use Macintoshes because of the technical excellence of the system. They want to use them because they've had previous experience with the system or because it will help improve their productivity.

When you know a computer system well — you learned to use it at school or in a previous job — you're going to prefer to stick with it unless you are a nerd who wants to play with something new.

It's true that Macintosh users are a trifle religious about the system but so are users of Unix and Windows systems, and each of those is seen as a mainstream computer.

When Macintosh users finally manage to get their systems — often after battling with MIS — getting on the network can be a problem. Some MIS groups will simply drag their feet and try to ignore that the Macintoshes even exist.

Because Macintoshes have built-in networking, departments and groups based on them often just go it alone, and an isolated network springs up. Ironically, these networks often run better than the corporate net.

The strange thing about the attitude of MIS executives toward networking Macintoshes is that Macintoshes are not difficult to integrate with a network. Both Banyan Systems, Inc. and Novell, Inc. have

See PC-ism, *page 21*

New Ungermann-Bass chief airs company's networking strategies

When Roel Pieper joined Ungermann-Bass, Inc. as president and chief executive officer in September following the departure of founder Ralph Ungermann, the company was in a tailspin.

The wiring hub vendor's focus on the high-end of the market when the middle tier was taking off brought about two consecutive quarters of net losses and a call for a new direction.

Enter Pieper, who is placing an increased emphasis on meeting customer demands, such as by making UB's products easier to manage. The former Novell, Inc. executive spoke recently with *Network World* Senior Writer Skip MacAskill to discuss UB's strategy and goals.

What are the major challenges facing UB?

In UB, you have a company with a reverse need of its competitors in terms of needing to announce more mid-range and lower end products. Our rivals need to announce more high-end products.

While other people are moving up the food chain, we're essentially taking the assets and investments we have from systems like [the Asynchronous Transfer Mode switch we developed with Bolt Beranek and Newman, Inc.] or our Access/One [intelligent wiring hub] and bringing them back into more mid-range products, such as stackable hubs. It's easier to spec products down than to create newer and more complex products that you've never done before.

The advantage to customers is that they gain the functionality of high-end proven technologies in products that are in a much more affordable price spectrum.

You've been in place as CEO now for about two months. What have your initial observations been about UB?

There are several things that I'm going through right now as the new man on-board. I'm essentially looking at two fundamental business aspects that involve the market and the customers.

My challenge is to create an environment in which technology-driven priorities play a role but not to the extent that the focus on the business, profitability or customer fronts is damaged.

With me, market-driven issues come first. Customer-driven issues come second, although the two are basically the same. Product- and technology-driven issues come third. It doesn't mean they don't have any priority, but they come after I understand that they make business sense and after I understand that people really need them as solutions. The position of UB now is not on point product.

In the networking industry, cost of ownership is becoming the problem, rather than what the latest or greatest product is. The problem is how to keep all those different products working together.

I think that's a position that UB can uniquely take throughout the organization because it can already deal with its customers on the higher complexity and service levels.

See UB, page 21

> "My challenge is to create an environment in which technology-driven priorities play a role, but not to the extent that the focus on the business, profitability or customer fronts is damaged."

Roel Pieper
President and CEO
Ungermann-Bass, Inc.

Beame & Whiteside bolsters server software offerings

BY SKIP MACASKILL

Raleigh, N.C.

Beame & Whiteside Software, Inc. has unveiled new server emulation software that allows Novell, Inc. NetWare users to access resources on Sun Microsystems, Inc. Solaris and Microsoft Corp. Windows NT servers.

The company also introduced software that allows users to convert DOS- and Windows-based personal computers into Network File System (NFS) network servers.

Typically, NFS servers require a Unix platform.

Beame & Whiteside's new MultiConnect Internetwork Packet Exchange (IPX) software was developed for NT and Solaris servers to provide seamless file and print services with NetWare clients.

The software basically involves loading Novell's IPX/Sequenced Packet Exchange (SPX) protocol stack on the NT and Solaris systems.

MultiConnect is designed to save users money by enabling them to buy one piece of software for the server, from where they can control network access, rather than licensing separate software packages for each NetWare client.

MultiConnect Server for Windows NT uses an IPX driver that works with Microsoft's Network Driver Interface Specification to access the network, while MultiConnect Server for Solaris uses a Transport Protocol Interface loaded into the Unix kernel to achieve network access.

See Beame, *page 21*

BRIEFS

For a limited time, users looking at buying or upgrading any **IBM** LAN Network Manager software can receive a 25% discount on onetime charges and upgrade fees. The discount covers most of the LAN Network Manager products from LAN Network Manager 1.1 to LAN Station Manager 1.0. Users must call IBM Direct to place the order before Jan. 24, and installation must occur no later than April 30.

IBM Direct: (800) 426-2255.

UniPress Software, Inc. recently unveiled a personal computer-to-Unix connectivity product that lets PC users on a network running Microsoft Corp.'s LAN Manager 2.2 network operating system access Unix server-based disks and printers.

LAN Manager for Unix (LMU) for SVR4.2 lets Unix systems act as servers for PC client applications on DOS, Windows, Windows NT, Windows for Workgroups and OS/2 platforms. Windows users can log on to the network from within Windows to use familiar PC applications.

The price of LMU for SVR4.2 ranges from $1,995 for a 24-user server to $7,995 for an unlimited user license server.

UniPress: (908) 287-2100.

Security Dynamics, Inc. has introduced a new version of its card-based security system for Apple Computer, Inc.'s Remote Access MultiPort Server and will begin beta-testing early next year a similar version for OS/2-based networks.

The firm's SecurID system requires end users logging on to a computer to type both a secret identification number and another number generated every 60 seconds by both a net server and a card they must carry with them. The card uses an LED display to show the current number. Security Dynamics will work with IBM to integrate the system into OS/2.

Pricing for the Apple version starts at $395 for a 10-client package and $50 for each server. SecurID cards cost $62 each.

Security Dynamics: (617) 547-7820.

Executive Software International has beefed up its File Alert file corruption detection software for Windows NT nets with a

See Briefs, *page 21*

Only Bell Atlantic offers three ways to shorten the distance between you and future ATM technology.

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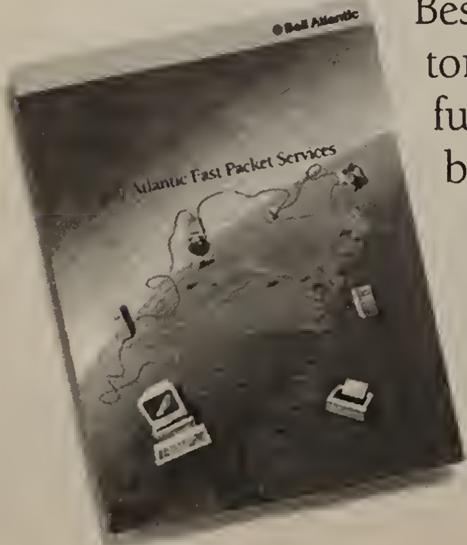

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Call 1 800 422-0455

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PC-ism

Continued from page 19

extensive support for Macintoshes, as do many other server and peer network system vendors. And thanks to the Macintosh's built-in networking capabilities, it is easier to support and to diagnose networking problems with them than it is for the mess we tolerate under DOS.

It seems that the main reason for Macintosh user PC-ism is a simple intolerance and unwillingness to move outside the accepted norm. The MIS management working in understaffed, underfunded shops figure they are working hard enough without another system to support. Who wants another headache?

One reader wrote to me recently asking what the ratios of support staff to servers and PCs should be. The answer is that it should be what you can cost-justify. Gibbs' Maxim: If technology doesn't make or save money, who cares?

But once MIS management start to dictate what is on the network by exercising PC-ism, they are going down a blind alley. MIS officials are in a weak position as soon as users can criticize them for not trying to support something new. Moreover, it's not as if the operating systems world is never going to change. Sooner or later, a new operating system will come along that has to be supported.

The main reason for Macintosh user PC-ism is a simple unwillingness to move outside the accepted norm.

Rather than PC-ism, MIS should only raise objections to systems that they can't afford to support. They need to be able to cost-justify that position by explaining what money is spent on, what funds are available and what the organization plans to do.

Macintosh users are really the tip of the iceberg. Heterogeneous networks will become even more the norm in the years ahead, and PC-ism will not only be unacceptable, but impossible. Embrace your Macintosh users now and get prepared for the future.

➻Gibbs is a consultant and writer in Ventura, Calif. If you would like to comment, call him at (805) 647-2307, or send E-mail via CompuServe at 75600,1002 or the Internet at mgibbs@rain.org.

UB

Continued from page 19

The nontechnical focus seems out of the ordinary for a high-technology supplier.

One of the advantages of running a company in a nontypical [information technology] manner is that you can react to market issues and customer issues more rapidly. If you run the company from a pure technology perspective — which many do — you typically miss a lot of the customer needs.

Is your focus different from UB's focus before you arrived here?

I think so. It's different not only from how the company operated internally, but also in the way UB talks to customers and states its mission. There have been phases where UB talked about being a network integrator, but that's different now. While that mission also involves putting everything together for the customer, it does not mean that everything you do conforms to this notion of manageability and serviceability.

Those issues involve self-managed hubs, better defined net management throughout the entire product line, as well as the tools you provide on top of that to do net simulation, planning and forecasting of your net loads and costs. The market is evolving in a similar way to what happened in the computer industry in that the value is moving from a hardware/software focus to more service-oriented issues.

UB still needs to have a product evolution strategy. What does that include?

Are we investing in next-generation products? Absolutely, but [we're doing it] under this umbrella of consistent management, serviceability and cost of ownership awareness. Do we want to beat people on price and performance? Sure, but that's part of the other philosophy I'm working on. I haven't had time to get all the product nitty-gritty under my skin to feel comfortable enough to start announcing or changing things. In the early part of 1994, product announcements will be the issue, whereas now it's more business issues.

The industry is moving from shared LANs to switching environments. How well-positioned is UB for this?

With products such as [the] DragonSwitch [Ethernet switching module for the Access/One] and [our ATM switch], we're in a great position. Going from shared to more dedicated bandwidth is a normal evolution of how to distribute bandwidth across different protocols and different users. It's not the endpoint; it's another stage in our struggle to better allocate and manage bandwidth.

Switching will remain a key technology when you look further ahead and start piecing ATM into existing environments. That's why the LightStream 2000 ATM switch is so well-positioned. For users that can't afford to take ATM to the desktop in the next two or three years, the switch gives them the ATM backbone capabilities they need to leverage the Ethernet LAN switching they get through DragonSwitch.

I don't believe in this scorched-earth strategy that a lot of companies like Fore [Systems, Inc.] are doing. Fore sounds like NeXT [Computer Corp.] seven years ago when Steve Jobs thought he could center the entire infrastructure around his box because the box was so good. Well, I think the market has taught him different. A much bigger issue is how do you fit into an existing environment.

"Do we want to beat people on price and performance? Sure, but that's part of the other philosophy I'm working on."

How does UB's ATM strategy accommodate for existing LANs?

We have three or four development projects going on that have a number of targets for announcement early next year. First, we're going to redefine the company image and business model, and then overlay that on our product strategy in early 1994. Those products will include ATM, 100Base-VG and more DragonSwitch products, as well as LightStream evolution and a next-generation hub.

A lot of what you hope to accomplish relies on leveraging existing relationships with key vendors, something UB has had trouble doing in the past.

You are absolutely right. The business relationships that we've had in the past were great ideas that just never reached their fruition. I can look at those situations very coldly and assess why we're doing them and how it adds to the bottom line. While I can get excited about the joint products and the opportunities, I first need to understand how we can get the relationships to be productive, as well. In early 1994, that will be part of the overall cleanup. ◼

Beame

Continued from page 19

Both server emulation packages offer full file services, support multiple concurrent users, and have full bindery and queue management capabilities. A multidirectional printing feature lets the user print to devices networked to NT or Solaris servers as well as to NetWare print servers.

The printing capability is made possible for the Solaris server package via Beame & Whiteside's MultiConnect Client for Solaris. This product, which comes bundled with the Solaris server software, lets Solaris users mount NetWare directories as if they were Unix files and redirect print output to NetWare print servers.

Since Microsoft embeds similar technology in NT, Beame & Whiteside did not have to add the feature to its NT server software.

A MultiConnect IPX server can function even without native NetWare services on the network, allowing users to access DOS utilities on an NT or Solaris server.

Both MultiConnect server offerings include the MultiConnect Virtual Terminal Server, a feature that lets NetWare users log on to NT systems using an NT command window or on to a Solaris system using a Unix prompt.

MultiConnect Server for Windows NT and MultiConnect Server for Solaris will be available in the first quarter of 1994.

Both the NT and Solaris server packages will cost $849 for a five-user license or $9,695 for an unlimited number of users.

Beame & Whiteside also introduced BW-Server, which allows Intel Corp.-based PCs running Windows or DOS to act as NFS servers to DOS, Windows and Unix clients.

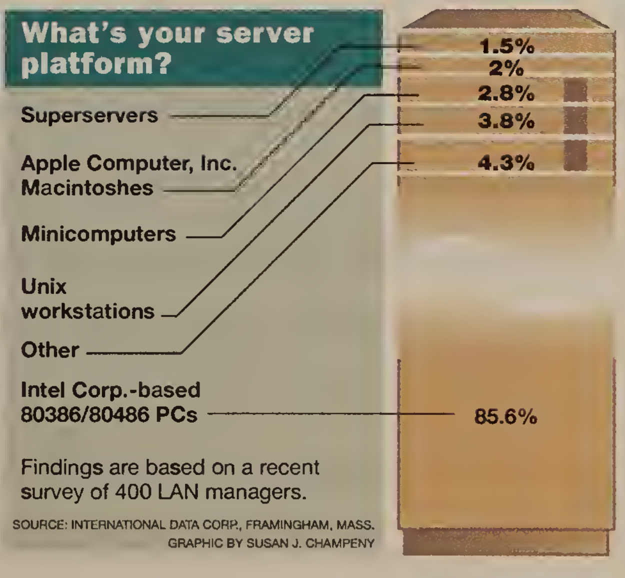
The software offers three modes of operation. It can operate as a stand-alone DOS application, acting as a dedicated server devoted to NFS file and resource sharing; as a terminate-and-stay-resident program, operating as a background server, allowing the PC to be used to run other applications, as well; and as a Windows server, performing DOS and Windows tasks while operating as an NFS server.

The application can support connections to remote NFS hosts so Unix users can access local PC-based files and resources, as well as Unix file naming conventions and standard DOS 11-character file names.

The software, available now, will run on any X86-based PC with DOS 3.1 or later, or PCs supporting Windows 3.X.

It costs $449, or $99 for existing Beame & Whiteside users.

©Beame & Whiteside: (919) 831-8989.



Findings are based on a recent survey of 400 LAN managers.

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

Comments

If you have a comment on this or any other article, drop us a fax at (508) 820-3467 or call (800) 622-1108, Ext. 487.

BRIEFS

Continued from page 19

scheduling function that lets a systems administrator predefine intervals at which the network is scanned for worn-out disks, power failures, user error or software defects. The product will ship with the new feature this month for $99.

Executive Software: (800) 829-4357.

Accton Technology Corp. has introduced a peer-to-peer networking package that lets users of laptop computers share resources. LanSoft On The Go is a self-contained starter kit that includes LanSoft peer-to-peer software, an external pocket-size Ethernet adapter, an NE2000-compatible 16-bit Industry Standard Architecture net interface card and cabling.

This product hooks together two laptop users and lets them share files, printers and CDROMs. The LanSoft software is expandable to support as many as 64 computers and can tie the peer-to-peer laptop network to Novell, Inc. NetWare networks. The starter kit is available now for $199.

Accton: (603) 889-5889.

IBM has taken another stab at Microsoft's Windows by announcing OS/2 Special Edition for Windows, a product that will let DOS Windows users migrate existing applications to OS/2. OS/2 Special Edition for Windows bypasses DOS and runs as a full 32-bit operating system, delivering all the features of OS/2 2.1. Generally available now, the software has an introductory price of $49.

Rememory Corp. has brought out the Rememory Secure MiniTower Archiving Server, a preconfigured hardware/software product that provides virtually everything the administrator needs to back up a Novell, Inc. NetWare 4.01 LAN.

A single drive system is available now for $6,995.

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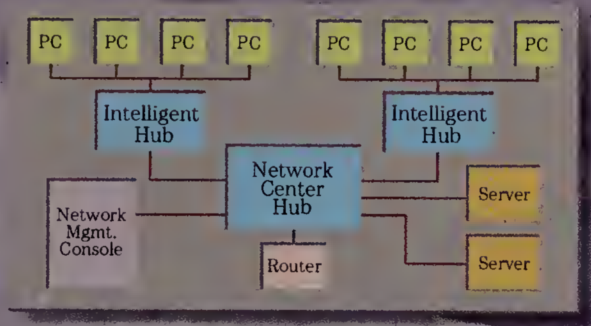

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A critical component of the structured network is SynOptics' new Optivity™ management software. Its simple, intuitive user interface lets you create a topology maintained entirely by software, greatly simplifying the task of managing complex networks. For example, with a simple drag-and-drop operation, you can assign network devices to logical workgroups—regardless of their physical location. This means you can configure your network to support the way you work, not the way your buildings are wired.

Now, before you get completely wrapped up in just the Lattis System 5000, turn the page to see how it fits into an even bigger package—the LattisSphere™ System.

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The LattisSphere System is modular too—buy just what you need now, then integrate new products later. As your business grows, you can be assured the LattisSphere System will grow with it.

To learn more about the LattisSphere System, call 1-800-PRO-NTWK, ext. 30, or return the attached card. We'll be happy to send you the complete wrap-up.

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SMDS-based research net goes on-line

BY BOB WALLACE

Pittsburgh

A trio of topflight colleges last week began sending traffic over a nationwide T-3 SMDS network that will eventually link 34 universities on one of the largest research and development networks in the world.

The Telecommunications Research Network (TERN) will initially be a large, private Switched Multimegabit Data Service net that will eventually use Asynchronous Transfer Mode (ATM)-based switches.

TERN will be used by universities that have networking degree programs and want to provide hands-on equipment and services training to their students (see graphic, this page).

"That experience is only available at a small number of progressive schools," said Jim Sobczak, former president of the International Communications Association and president of TERN, a nonprofit group here. "The goal of TERN is to provide solid education."

Anderson Consulting designed the net, which Sobczak said is worth several million dollars. He added that the interoffice segment of the Pittsburgh-to-Texas T-3 alone would have cost the organization roughly $800,000 a month if MCI Communications Corp. had not donated it. Siemens Stromberg-Carlson kicked in three EWSM SMDS switches with a combined retail value of roughly $1.2 million.

See **Research net**, *page 28*

Heading up TERN

Major players in the Telecommunications Education Research Network (TERN)

Participating universities include:

- Carnegie-Mellon University
- University of Colorado
- De Paul University
- Georgia Institute of Technology
- Michigan State University
- Northwestern University
- University of Pittsburgh
- Stanford University
- University of Texas

Sponsors:

- ADC Kentrox
- Ameritech
- Andersen Consulting
- AT&T
- Bell Atlantic Corp.
- Cisco Systems, Inc.
- Digital Equipment Corp.
- Digital Link Corp.
- IBM
- International Communications Association
- MCI Communications Corp.
- National Telecommunications Industry Association
- Northern Telecom, Inc.
- Racal-Datacom, Inc.
- Siemens Public Switching Systems
- Southwestern Bell Corp.
- US West, Inc.
- Westinghouse Communications

Sponsors provide equipment, services, manpower or money.

SOURCE: TERN, PITTSBURGH
GRAPHIC BY TERRI MITCHELL

UPS ready to convert voice dispatch operation to wireless

BY ELLEN MESSMER

Mahwah, N.J.

United Parcel Service, Inc. (UPS) is sold on cellular.

Last February, UPS cajoled 50 cellular carriers into a technical alliance under which they now provide UPS a customized, nationwide cellular service. The package shipping firm's drivers use the service to cost-effectively transmit delivery information from their trucks to the company's data center, which in turn can relay up-to-the-minute status reports to customers on their shipments.

That makes UPS the country's single largest user of cellular services. But the company isn't stopping there; it plans to move its dispatch operations from private voice radio to cellular data early next year.

Instead of having to receive dispatch information via voice radio or pager and then write it down, UPS drivers will view all necessary customer data on the new version of the UPS Delivery Information Acquisition Device (DIAD), a portable data collection device designed by UPS and built by Motorola, Inc.

"It will give the drivers more information about what the next stop is and how to plan their day," said Daneen Cooper, systems manager of wireless technologies at UPS.

The new, lighter weight DIAD II computerized clipboards will have 50% more storage capacity than the those now in use. The new DIADs will also be equipped to read the new type of bar-code labels that UPS developed, which provide destination and tracking information.

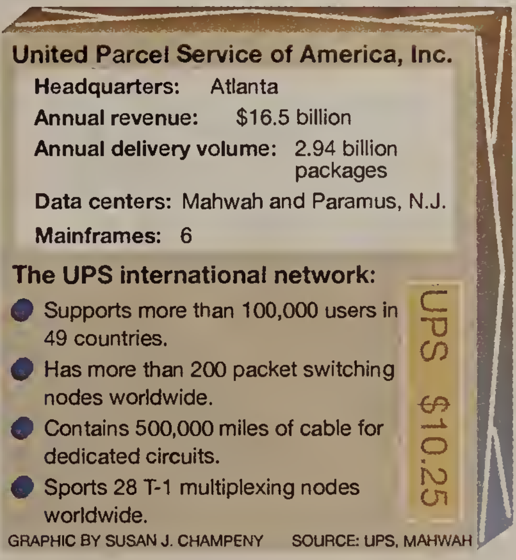
The older electronic clipboards predate UPS use of cellular data. They were retrofitted with special adapters and cellular modems when UPS decided to use data over cellular to better track packages.

To transmit cellular data, the UPS trucks have interior antennas that broadcast data to the nearest cellular base station. The call is then routed over the landline portion of a cellular carrier's network to UPS's data center here.

The specialized numbering scheme creates a seamless cellular net for UPS, allowing cellular calls to be routed directly to nodes on UPSnet, the company's private network (see graphic, this page).

UPS, which handles 11 million packages per day, is currently testing data-over-cellular service and the new DIAD II for its dispatch operations, which will

See UPS, *page 28*



United Parcel Service of America, Inc.

Headquarters: Atlanta
Annual revenue: $16.5 billion
Annual delivery volume: 2.94 billion packages
Data centers: Mahwah and Paramus, N.J.
Mainframes: 6

The UPS international network:

- Supports more than 100,000 users in 49 countries.
- Has more than 200 packet switching nodes worldwide.
- Contains 500,000 miles of cable for dedicated circuits.
- Sports 28 T-1 multiplexing nodes worldwide.

GRAPHIC BY SUSAN J. CHAMPENY SOURCE: UPS, MAHWAH

AT&T, MCI ante up rebates under account review programs

BY BILL BURCH

Washington, D.C.

Schaffer's Pest Control in Snow Hill, S.C., appreciates the $4.09 in savings MCI Communications Corp.'s Proof Positive account review program turned up.

The exterminating firm got the good news earlier this month when the long-distance carrier sent out the first wave of Proof Positive reviews to small businesses across the nation. MCI discovered that the company could save a few dollars by adding a frequently called number to the list of numbers that carry a 20% discount under the its Preferred long-distance plan. The savings wasn't much, but Schaffer's Georgia Phillips said it shows that MCI is trying.

AT&T, which in August announced a similar account review program dubbed Maximum Advantage, this month joined MCI in sending out review statements to its small business customers. The statements notify customers of minor savings that can be made by adjusting long-distance service plans. The carriers insist that the large majority of their customers are on the right plan already and what the account reviews really offer is peace of mind.

For the reviews, AT&T and MCI examine customers' bills to compare calling patterns against service offerings. The reviews are meant to spot service problems for small companies that a larger customer account representative might notice for bigger firms.

If customers are not on the best plan for each portion of their long-distance traffic, suggested service changes are offered and the businesses are credited for any savings that an alternate plan could have secured. For example, if a carrier finds a customer making a series of two-minute calls from a particular extension, it might suggest switching to a facsimile line.

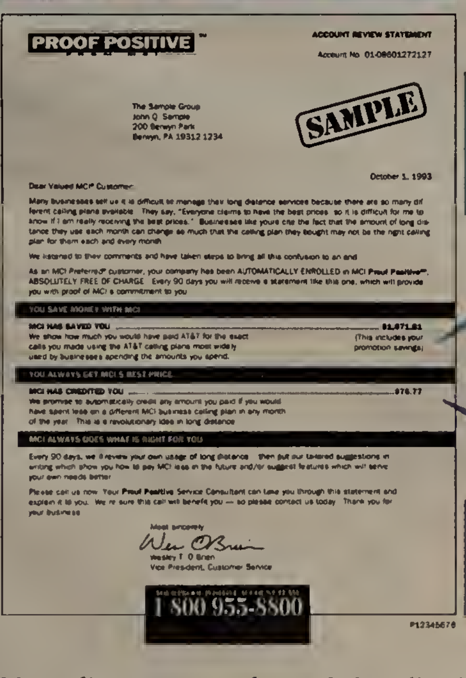
The MCI account reviews cover its Preferred and Vision customers spending more than $5 per month. AT&T's plan covers customers spending more than $200 per month on any of 12 small business services that provide outbound, 800 and WATS service.

The two carriers review each customer's account on a quarterly basis.

In the account review tariff filings, MCI committed to offering the reviews as a permanent feature of its business services, while AT&T said the service would be a pro-

See **Programs**, *page 28*

MCI's Proof Positive



PROOF POSITIVE™

ACCOUNT REVIEW STATEMENT
Account No. 01-08601272127

The Sample Group
John Q. Sample
200 Berwyn Park
Berwyn, PA 19312 1234

SAMPLE

October 1, 1993

Dear Valued MCI® Customer:

Many businesses tell us it is difficult to manage their long distance services because there are so many different calling plans available. They say, "Everyone claims to have the best prices, so it is difficult for me to know if I am really receiving the best prices." Businesses like yours cite the fact that the amount of long distance they use each month can change so much that the calling plan they bought may not be the right calling plan for them each and every month.

We listened to their comments and have taken steps to bring all this confusion to an end.

As an MCI Preferred℠ customer, your company has been AUTOMATICALLY ENROLLED in MCI **Proof Positive**℠, ABSOLUTELY FREE OF CHARGE. Every 90 days you will receive a statement like this one, which will provide you with proof of MCI's commitment to you.

YOU SAVE MONEY WITH MCI

MCI HAS SAVED YOU $1,671.81
We show how much you would have paid AT&T for the exact calls you made using the AT&T calling plans most widely used by businesses spending the amounts you spend. (This includes your promotion savings)

YOU ALWAYS GET MCI'S BEST PRICE

MCI HAS CREDITED YOU $76.77
We promise to automatically credit any amount you paid if you would have spent less on a different MCI business calling plan in any month of the year. This is a revolutionary idea in long distance.

MCI ALWAYS DOES WHAT IS RIGHT FOR YOU

Every 90 days, we'll review your own usage of long distance, then put our tailored suggestions in writing which show you how to pay MCI less in the future and/or suggest features which will serve your own needs better.

Please call us now. Your **Proof Positive** Service Consultant can take you through this statement and explain it to you. We're sure this call will benefit you — so please contact us today. Thank you for your business.

Most sincerely

Wes O'Brien
Wesley T. O'Brien
Vice President, Customer Service

1 800 955-8800

P12345678

MCI HAS SAVED YOU.........$1,671.81
Amount customer would have paid AT&T for the same calls using the AT&T calling plan most widely used by comparable customers.

MCI HAS CREDITED YOU.......$76.77
Amount MCI refunds if customer would have spent less using a different MCI service.

BRIEFS

Value-added network provider **Infonet Services Corp.** last week announced new service-level agreements for users that commit to contracts of at least one year with a minimum of $10,000 of usage a month.

Infonet's Charter service-level agreement lets customers get out of service contracts if annual port availability slips below 99.9% in 17 large U.S. and foreign cities. It guarantees 99.5% annual port availability to the 130 other cities that it serves worldwide.

With its Medallion service-level agreement, the carrier will provide a free month of service if annual port availability for end-to-end links falls below 99.9%. Infonet also guarantees it can get any user site in the countries it serves on-line within 21 days and supports a repair mean time of four hours in the U.S. and as little as eight hours in foreign countries.

A Federal court last week dismissed **AT&T** lawsuits against **MCI Communications Co.** and **Sprint Corp.** that claimed the two carriers broke the 1934 Communications Act by providing interstate services at rates not on file at the Federal Communications Commission. The court said the commission should review AT&T's complaint.

All the horsepower in the world is worthless if you can't make the most of it. And the same is true when it comes to computers. Performance is determined not only by the chip, but by the computer around the chip. After all, if the subsystems slow you down, having a powerful processor doesn't make much difference.

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486SX/33, 486DX2/50, 486DX2/66, 60MHz Pentium ◆ 486 models upgradeable to Pentium technology ◆ QVision local bus graphics with 1MB VRAM ◆ Enhanced Business Audio ◆ Most 486 systems Energy Star compliant ◆ Plug and play ready ◆ 170MB to 525MB Hard Drives ◆ 4MB or 8MB standard RAM (upgradeable to 32MB on 486, 136MB on Pentium) ◆ 4 ISA slots (one reserve) ◆ 3 drive bays ◆ 64K or 256K optional cache ◆ Free 3-year warranty* ◆ Free 7x24 phone support

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For the ultimate in performance, however, we introduce the Deskpro XE with the Pentium processor. Compaq-designed TriFlex/PC Architecture optimizes the tremendous power of the Pentium chip, delivering significantly improved overall system performance. All at a price that you will find equally impressive.

For complete information on the new Deskpro XE computers, just call us at 1-800-345-1518. And discover why even when they have the same processor, other computers just aren't up to speed.

COMPAQ

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Circle Reader Service #9

Programs

Continued from page 25

motion. However, both carriers may find themselves locked into the service due to users' expectations, according to Robert Self, editor of *Long Distance For Less,* a tariff analysis publication by consultancy Market Dynamics in New York.

And AT&T doesn't have as much to gain from the service as MCI because MCI compares its rates against AT&T's, while AT&T compares rates only against other AT&T services, Self said. The rebate offer essentially wipes out the differences between the numerous small business services AT&T has developed, he said.

On the other hand, AT&T's account review may keep customers from straying from the fold, he added.

While customers might have considered asking for other carriers' bids during an account review, the Maximum Advantage program should reassure some users that they're getting a good deal.

UPS

Continued from page 25

require mainframe information to be transmitted to 60,000 UPS drivers.

UPS squeezes efficiencies out of cellular by aggregating messages from the customer package pickup point before transmitting them to the data center. This message bundling, performed in a buffering process by special cellular modems built by Motorola, Inc., saves UPS from having to pay to set up a circuit-switched cellular call for one message.

Now UPS can reach about 98% of the country using cellular.

And although cellular calls are usually charged by the minute, UPS obtained special subminute incremental charges, making cellular economically feasible on a large scale.

"Our average call is 15 seconds, and messages average about 200 bytes," Cooper said. Under these contract terms, UPS does not pay for an entire minute if it does not use it.

As part of the service provided under the national cellular alliance it forged, UPS also gets one monthly bill, not dozens of them from different carriers.

Now UPS can reach about 98% of the country using cellular.

Although data-over-cellular service has worked "amazingly well," Cooper said UPS is likely to be looking at alternatives once its three-year contract is up. Among them is Cellular Digital Packet Data (CDPD), which UPS first considered when it was approached by McCaw Communications, Inc. well over a year ago. At the time, UPS decided it would take too long for CDPD to be widely available. But that may be changing.

"Cellular Digital Packet Data is a definite option," said Cooper, who added that UPS is already testing CDPD with McCaw and other cellular carriers.

UPS has also looked at the existing wireless packet-data services, ARDIS Co. and RAM Mobile Data, Inc. but decided their suburban radio coverage was inadequate for them.

Research net

Continued from page 25

The participating universities and technical schools will make TERN available to corporations and vendors for a fee, money the schools will use to improve their networking programs to attract top students and faculty.

The net now comprises Siemens EWSM switches at the University of Pittsburgh, the University of Colorado and the University of Texas linked via MCI-provided T-3 lines.

Universities that want to access TERN can use a router donated by Cisco Systems, Inc., a data service unit/channel service unit provided gratis from Digital Link Corp. and a T-1 link to one of the three Siemens switches,.

TERN founders are tenatively planning to add ATM switches to the network, possibly by year-end 1994.

All 34 universities will be linked to the network in anywhere from 18 to 24 months. "It's not a flash cut," Sobczak said. "It's more like a never-ending process," although there have been no equipment or service problems yet.

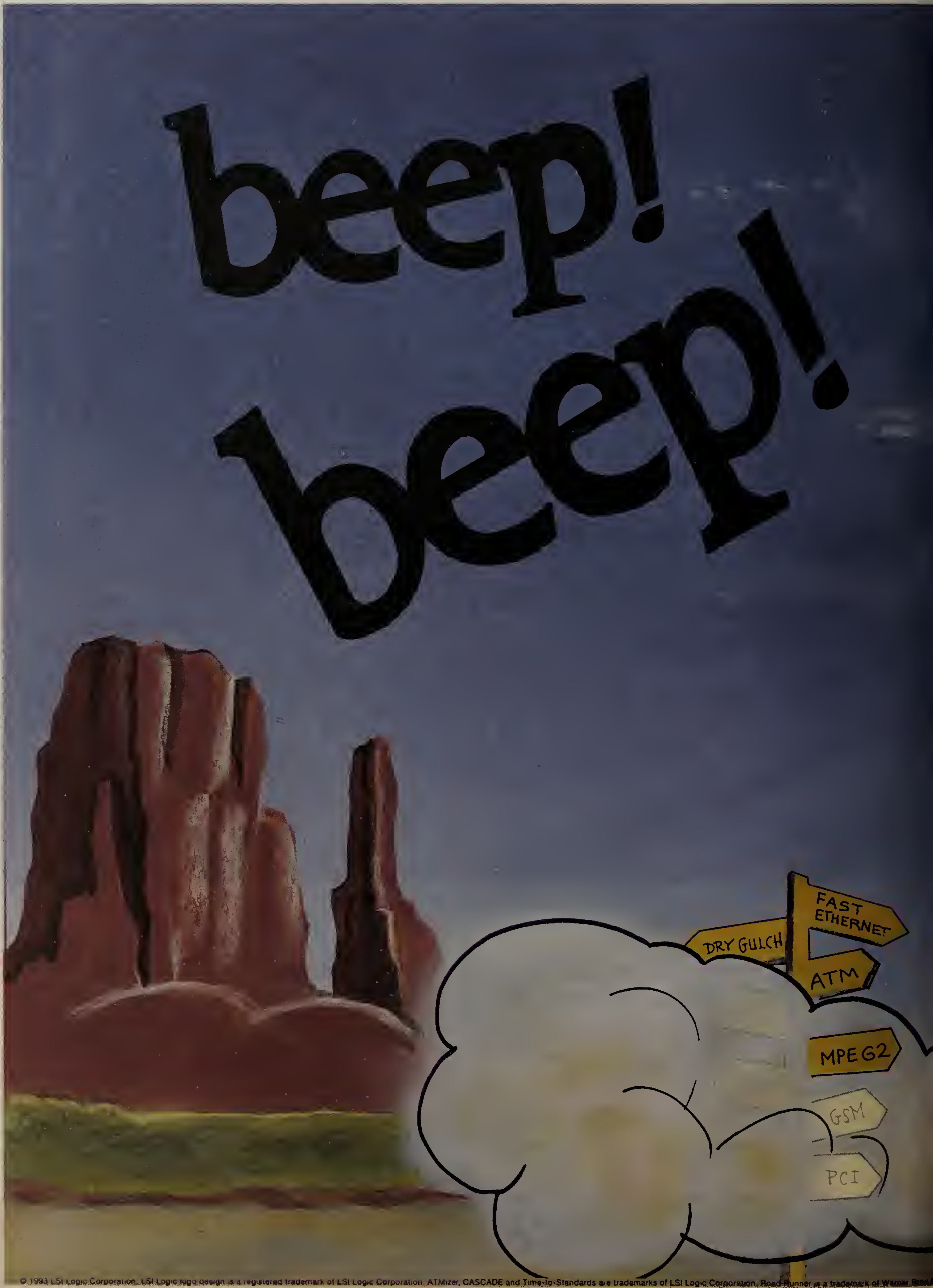
Sobczak noted that other colleges besides the original 34 are welcome to access TERN.

Some TERN participants have already begun thinking of ways for students to use the network.

"We're starting to develop some student exercises," said Sobczak. "One that I'm considering would be [to drop] the Siemens switches off the network and let the students learn how a router-based network operates."

In addition to academic use, the universities can employ the net to conduct research on the performance of new products before vendors make them commercially available, Sobczak explained.

©TERN: (412) 624-9431.



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RATE & TARIFF MONITOR

by David Rohde

Diversity is a smash, if you have the cash

Disaster. Failure. Downtime.

These are words that strike fear into the hearts of network managers. If your interexchange carrier is pushing you to allow it to handle access coordination, they've probably told you they can provide "diversity" — two or more paths for a private-line local channel or special access line.

MCI features diversity in its Custom Access program, and AT&T recently announced Enhanced Access Diversity (EAD). But everybody says they do it, fancy title or not. The only thing is, it costs money.

Thanks to AT&T, though, diversity pricing is finally starting to emerge from the tariff netherworld of Individual Case Basis. In its initial FCC filing last month for EAD, AT&T reported installation and monthly charges for customers in part or all of 18 mostly Western states. And there's a strong hint in the filing that the cost of diversity may be coming down as diversity arrangements become standardized.

EAD offers three options. Type 1 provides diverse lines between the local exchange carrier (LEC) central office and the AT&T POP. Type 2 provides diverse lines from the customer's premises to the POP, although both lines go through the same LEC central office. Type 3 provides diverse lines from premises to POP through separate LEC wire centers.

In most areas — such as California, served by Pacific Bell — Type 1 diversity costs $15 a month per line, Type 2 costs $20 a month and Type 3 costs $30 a month. In other areas — such as Arizona and Colorado, served by US West operating companies — Type 1 costs $15 a month, Type 2 costs $30 a month, and Type 3 is negotiable. Onetime installation fees run from $30 to $138.

It's important to remember that AT&T local channel private-line and access pricing — including the EAD option — is LATA-specific and based on a distinction between Bell operating company and independent operating company (IOC) territories. In some states, AT&T has tariffed EAD prices for BOC territories but not IOC territories. In other places, it's the reverse.

For example, AT&T has no EAD prices for Southern Bell territories in Florida but has issued IOC-territory prices of $15, $20 and $25 for EAD in Florida LATA 952. Onetime installation charges for EAD in GTE areas seem to be standardized at $66.

In an unusual bonus, AT&T reported in its tariff filing what individual customers who signed up for diversity before EAD was announced are now paying. In many cases, these costs are strikingly higher than the new tariffed offering. Three examples:

- American Family Insurance is reportedly paying $570.48 a month for a diverse route between its Minneapolis site and an AT&T POP in Eden Prairie, Minn.
- Fleet Services Corp. is reportedly paying $1,012.60 a month between its office in Malden, Mass., and an AT&T POP in Framingham, Mass.
- Honeywell is reportedly paying $1,667.37 a month for a diverse route between a Chicago POP and a Honeywell office in Arlington Heights, Ill., even though other Honeywell sites elsewhere are paying as little as $25.98 a month for diverse routing.

Questioned about these cases, an AT&T spokesman admitted the carrier should not have filed these cases under the new EAD section because they might be other kinds of arrangements.

AT&T used to price diversity based on individual LEC charges and AT&T special construction requirements. For consistency's sake, EAD was developed to provide predictable rates for the most common type of diversity requests. But it sure looks like some of these customers could do better by migrating, if they can, to the new tariffed rates.

➻ Rohde is associate publisher of the Center for Communications Management Information in Rockville, Md., a provider of rate and tariff information. He can be reached at (301) 816-8950, Ext. 292.

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ELECTRONIC MAIL

by David Ferris

WordPerfect Office 4.0: It's worth a look

WordPerfect Corp.'s new release of WordPerfect Office, 4.0, looks as good on the outside as it does on the inside.

Not only is the product striking from the user's point of view — its tight integration of E-mail and scheduling is particularly notable — but its underlying architecture has also had a major overhaul that E-mail administrators will appreciate. Here's a look at some of the things that stand out.

A fundamental WordPerfect Office function is to send from place to place objects, such as mail messages, files, forms and task requests. With Version 4.0, users can find out the status of objects they've handled no matter where they are located. For example, a user can see the following:

- Whether a message has been read.
- Whether an expense request form sent to a supervisor has been approved and passed on to accounting.
- Whether someone accepted a meeting request or delegated it to someone else.

With WordPerfect Office, status reporting is built in as a basic service. Whatever the type of object you're dealing with, you can find out where it is in a work flow.

This is a powerful idea. It makes the software attractive as a transport for mission-critical applications since it is reliable and manageable. Assuming WordPerfect builds upon this base, users and administrators will be better able to receive automatic alerts when the messaging system malfunctions, track the problem and diagnose it.

WordPerfect Office has a growing family of gateways. They are available for Novell, Inc.'s NetWare Message Handling Service (MHS)/NetWare Global Messaging Systems, IBM's Professional Office System (PROFS) and OfficeVision systems, the Simple Mail Transfer Protocol (SMTP) and X.400. The gateways share 75% of their concepts and much of their code.

This lets E-mail administrators make the best use of their support people because once they know one gateway, they know most of what they need to about the others. It should also mean better gateways because more of WordPerfect's development efforts can be put into the technology-specific stuff.

WordPerfect Office offers users a single set of administration tools for all of the system's applications. This is unusual since administration tools for most E-mail systems and sister group scheduling programs are disjointed, with a shared user directory being the only common ground.

WordPerfect Office's management tools provide simultaneous name propagation for E-mail and group scheduling systems, as well as let administrators define the automatic deletion of messages, among other things.

So it's much simpler to learn the administration tools, it takes less time to do administration, and inconsistencies are less likely.

In a recent statement of direction, WordPerfect said that in 1995, WordPerfect Office client software will be able to generate and interpret X.400 protocols directly. This is the first such announcement made from a major personal computer E-mail vendor. If it comes to fruition, life could be a lot simpler for companies with X.400 backbones. Also, if WordPerfect does this for X.400, presumably they could do the same for other prospective backbone protocols, notably SMTP.

Today, most PC E-mail systems put their intelligence in user workstation software, but this is about to change, as vendors migrate to a client/server architecure. Here, work is divided between programs running on PCs and servers.

WordPerfect Office has taken several interesting steps toward supporting a client/server architecture. In particular, a server-based program called OFS can take over several tasks, including the sending of large numbers of messages, peforming tasks for remote clients and rules-based processing of incoming messages.

In short, WordPerfect Office's rewrite hasn't just improved the external appearance of the product. When evaluating it, be sure to take a good look under the hood.

➾ Ferris is president of Ferris Networks, a San Francisco-based E-mail consulting firm. He writes a monthly newsletter, *Ferris E-Mail Analyzer*, from which this article is drawn.

Object technology to drive new Chrysler payroll system

Applications to be moved from mainframe to servers.

BY TIMOTHY O'BRIEN

Centerline, Mich.

Having successfully reengineered the way it designs cars, Chrysler Corp. is now revamping many of its back-end systems, including a set of mainframe-based payroll applications it is moving to a client/server environment via distributed object technology.

Chrysler is revamping its payroll system to better enable the company to adapt to new legislation, union contracts and work force changes that require regular updates to the back-end applications. Chrysler's 20-year-old mainframe applications are not flexible enough to handle all of the changes inherent in running a payroll system for about 100,000 employees and operations spanning much of North America.

With an object-oriented approach, Chrysler hopes to achieve the required flexibility. The use of object orientation has enabled Chrysler to create a conceptual model of its payroll operation of the future — a model that effectively simulates the way work will be performed.

OUT WITH THE OLD...

Regulatory issues, union contracts and company operations require that Chrysler's payroll system be changed frequently — changes that over the years have increased the complexity of the company's batch-processing system. Meanwhile, normal staff turnover within the systems support group threatens the maintainability of the system, and the business models that provided the original rationale for the payroll system no longer apply.

Because Chrysler's mainframe-based data centers are running at near maximum capacity and the processing windows are narrow, batch reruns can be unfeasible. The payroll programs are written in an earlier version of COBOL and conversion to COBOL II would cost millions of dollars.

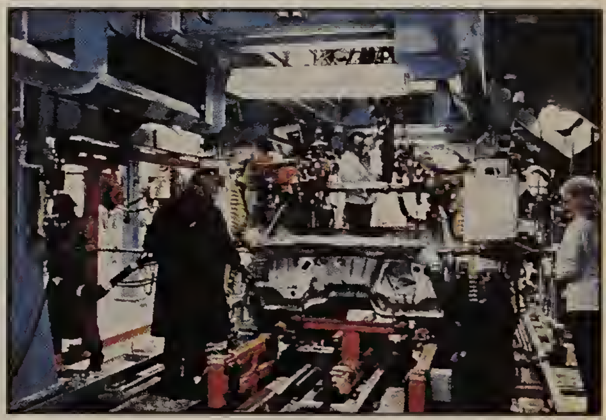
Commercially available payroll applications were considered, but they contained many of the same limitations found in the existing host-based system. The one-size-fits-all approach of these products failed to meet Chrysler's needs without substantial customizing.

So using a formal business-process redesign structure, a part-time team of 10 people analyzed and documented the payroll business requirements and proposed that the payroll system be moved off the mainframe and rewritten using object technology.

...IN WITH THE NEW

Chrysler began redesigning its payroll system by working on a new program for the executive payroll, which covers about 8,000 employees. Using ParcPlace Systems' VisualWorks Smalltalk and Hewlett-Pack-

See Chrysler, *page 34*



Chrysler's new payroll system will help it keep a better handle on the variety of jobs at company manufacturing plants like this.

BRIEFS

The Object Management Group (OMG) last week announced the adoption of specifications for object services in support of its Object Management Architecture.

These object services will form a platform for developing distributed object systems. The Common Object Services Specification (COSS) will join the Common Object Request Broker Architecture as adopted specifications of the OMG.

The COSS specification is based on the Joint Object Services Submission, a collaboration among 21 companies.

Of the more than 20 services called for by the Object Services Architecture, COSS covers the three basic ones on which most other services depend — naming, event modification and life cycle. The published specification for Common Object Services Volume 1, will be available directly from OMG for $50 in early 1994.

OMG: (508) 820-4300.

Fortis, Inc., a large provider of insurance and financial services, will use **Andersen Consulting**'s Foundation for Cooperative Processing 2.0 tools and services to develop enterprise standards for its client/server applications.

Fortis will start with a 1,000-workstation, three-city client/server system to collect and process image-based insurance claims. The company paid $1 million for the Andersen development products.

Andersen: (312) 580-0069.

The Worldwide Association of Lotus Notes Users and Technologists (WALNUT) said a three-month test to link Lotus Development Corp.'s Notes users via CompuServe, Inc.'s computer network was a success.

According to WALNUT, it will continue the service, in which association members with CompuServe accounts can connect to CompuServe and download or replicate discussion databases on Notes issues, as well as a variety of Notes product databases offered by Lotus.

WALNUT: (508) 443-3330, Ext. 1223.

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name in networking
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Chrysler

Continued from page 31

ard Co.'s Distributed Smalltalk object-oriented software, application development is expected to take less than a year. Without object technology, Chrysler estimated it would take 32 months to build a new system, and it would still lack the flexibility needed.

With Smalltalk, programmers can develop code in modules that simplify the structuring of Chrysler's numerous employee groups. That way, the development team can move through the design and development phases without needing to first define all the processing requirements for all types of employees.

With object technology, payroll can be distributed over a network of less expensive Unix servers that allow for better integration of new technologies. For example, if payroll check generation ever needs to be moved into plant locations, the distributed object processing environment lets payroll match the new business requirements. Mainframe-based, procedural-programs would not adapt to such a move very easily.

"The object-oriented analysis process generated incredible enthusiasm on the part of the payroll user."

MAKING SMALLTALK

Smalltalk is an object-oriented programming language used in VisualWorks for creating graphical, client/server applications that are completely portable. HP's Distributed Smalltalk implements the Object Management Group's Common Object Request Broker Architecture for distributed object computing. HP's technology enables programmers to develop object-oriented applications that can be distributed and used simultaneously by multiple users.

By using object-oriented analysis, VisualWorks and HP's Distributed Smalltalk, Chrysler officials hope the company's new payroll system will generate as much enthusiasm internally as the company is trying to generate outside with its new cars.

DESIGNING WITH OBJECT TECHNOLOGY

Tom Hadfield, team leader of the new payroll system at Chrysler, said object technology allowed his team to create a system design that functioned the way the company did.

"The use of object-oriented analysis proved to be a natural and very productive method to determine the payroll requirements," Hadfield said. "The object-oriented analysis process generated incredible enthusiasm on the part of the payroll users."

An attempt to accomplish this task using a traditional structural decomposition analysis approach took 10 full-time people 10 months. Without having a way to add flexibility into the system, the results of this analysis yielded a payroll system that was in some ways as rigid as the old one. Using object-oriented techniques, a flexible design was achieved by 10 part-timers in only three months.

Using this payroll method, Chrysler expects to save a considerable amount annually in employee, development and maintenance costs.

The object-oriented approach made a complex process much simpler because it allowed people to use a more real-world model in simulating the way payroll operations are performed. Through this process, the object-oriented methodology kept them from being diverted from the fundamentals of the business. It also promoted abstraction of concepts facilitating design simplification and design component reuse.

LOWERING COSTS

By removing non-value-added processes through the object-oriented approach, Chrysler expects to lower the cost of calculating payroll. Since payroll will be an event-driven application that calculates wages as a continuous process of events – such as earning entitlements occurring daily – payroll will be transformed into a just-in-time system that is consistent with Chrysler's overall objective of being a rapid-response company.

Using this method, Chrysler expects to save a considerable amount annually in employee, development and maintenance costs. Exact figures were not available.

➡ O'Brien is president of One Abstract, Inc., a San Francisco firm providing strategic and creative services to the computing industry.

Comments

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Editorial

I recently chaired a panel discussion on the merits of three emerging high-speed network alternatives — frame relay, Asynchronous Transfer Mode and Switched Multimegabit Data Service — and the comments of one user on the panel neatly summed up the problem facing SMDS .

"I'm confused about SMDS," the speaker told his counterparts in the audience. "I don't understand what it is."

This executive represents one of the leading users of network technology, a company that's trialing some of the most advanced products on the drawing board today. It's making wide use of frame relay and is in the midst of an ambitious ATM migration plan.

If these folks don't see a clear role for SMDS, how can SMDS's backers — primarily the regional Bell holding companies — expect the general public to get it?

Oddly enough, the network manager in question could recite some of the key benefits of SMDS, such as its connectionless network capabilities and its potential to support intercompany networking. (For more on SMDS services, see this week's Buyer's Guide beginning on page 39.) The confusion stemmed more from questions about its availability, price and positioning vs. ATM, frame relay and private lines.

While SMDS has been around conceptually for quite some time, there are currently only about 100 customers and 300+ access lines installed. Only five of the seven RBHCs currently offer the service, and a key member of that family — Nynex Corp. — has no plans to offer it.

But availability is only part of the problem. ATM services aren't widely available, yet users are already factoring them into network plans. The painful truth is that most users I talk with just don't know or care that much about SMDS.

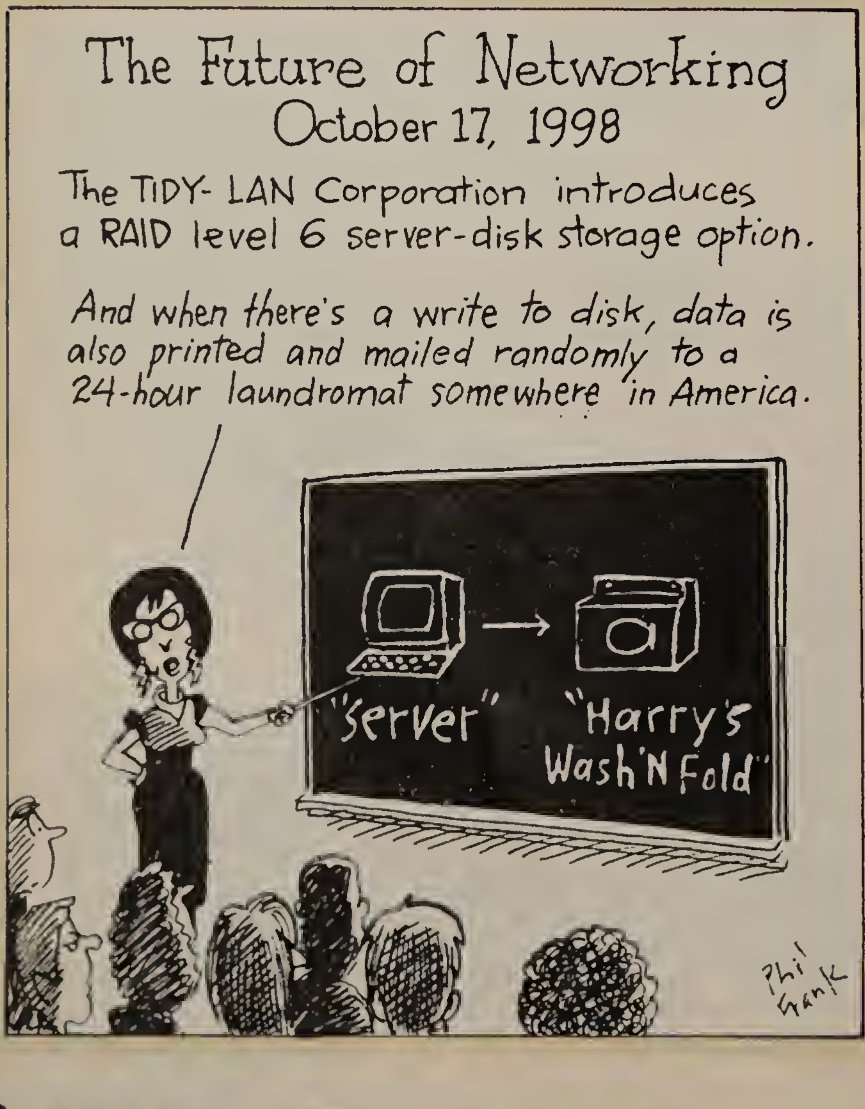
Despite the lessons of ISDN, the RBHCs still don't seem to realize that marketing and customer education are critical components in the success of any service. They can't rely on equipment makers, long-haul carriers, competitive access carriers or anyone else to carry the ball on SMDS. But so far, the marketing of SMDS has been business as usual for the RBHCs.

SMDS was developed by and for the RBHCs and if it is going to be anything more than an also-ran, they have to do more to clarify its very real technical benefits, their rollout plans and the costs of buying in to SMDS. If the RBHCs won't push harder for SMDS, why should users push for it all?

JOHN GALLANT

TELETOONS

FRANK AND TROISE


The Future of Networking
October 17, 1998
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And when there's a write to disk, data is also printed and mailed randomly to a 24-hour laundromat somewhere in America.
"Server"
"Harry's Wash'N Fold"
Phil Frank

MACROSCOPE

by James Kobielus

Microsoft will spread ESD word, but Novell will dominate market

It's only a matter of time before network-based electronic software distribution (ESD) becomes a standard practice in most organizations. ESD makes too much sense from a cost-, time- and labor-saving standpoint to be ignored for long, especially now that mature products are being offered by big-name networking vendors, such as Novell, Inc., IBM and Hewlett-Packard Co. Distributed computing will bog down in its own complexity unless tools are available to manage software assets scattered across servers, clients and other network nodes.

What will it take to bring ESD to the attention of mainstream network managers? I'm betting that Microsoft Corp. will put ESD on the industry fast track in 1994 with its Hermes product for Windows NT Advanced Server.

Hermes will capture a lot of press and make many users take their first serious look at ESD and its sister capability, electronic software licensing (ESL). Many users no doubt will acquire and install at least one copy of Windows NT Advanced Server on their networks just to give Hermes a spin.

The success of Hermes would be welcome news for Microsoft, since Bill Gates and crew have suffered their share of networking flops (e.g., LAN Manager), false starts (e.g., MS-NET), and underperformers (e.g., Windows for Workgroups).

Why should Microsoft succeed in popularizing ESD when other large, well-known networking vendors have come up short? The reasons are threefold.

First, Microsoft very much wants to succeed in the enterprise-networking business and will put its best marketing talent behind Hermes.

Second, Microsoft's ESD evangelists will have a strong product to pitch. Hermes promises to be a well-rounded, open desktop-management environment, combining ESD with such related functions as hardware/software inventory, remote diagnostics and control, virus detection and usage metering.

Moreover, Hermes will integrate with users' existing enterprise management systems through Simple Network Management Protocol and NetView interfaces, and will distribute software across most desktop and server operating environments. Hermes will extend network management down to the desktop through installation of industry-standard Desktop Management Interface agents on every client workstation.

But the key reason why Microsoft will popularize ESD is simply because it is Microsoft. The industry is more inclined to pay attention to Microsoft than to any other software vendor. In a sense, Microsoft is now the computing industry's designated visionary vendor. The media can't get enough of Bill Gates and his (admittedly, Microsoft-centric) grand designs, such as Information At Your Fingertips, Windows Everywhere, Windows at Work and Windows Open Services Architecture. Windows NT-based, cross-platform ESD is another big propeller-head dream that may take the telecommunications and computing industries by storm.

However, don't expect Microsoft to dominate the ESD market, even if Bill Gates makes Hermes the talk of every hospitality suite at every industry conference for the next year. Rather than dominating the market itself, Microsoft will serve to popularize ESD, thereby increasing the market's size and expanding opportunities for existing ESD vendors, including Novell, IBM, Tangram Enterprise Solutions, Inc., Telepartner International, HP and NCR Corp.

The main reason why Microsoft itself is not likely to dominate the ESD market is due to a serious limitation of Hermes: It will run only on Windows NT, an expensive, resource-hungry (albeit sophisticated) new operating environment. Will network managers invest in an entirely new operating system just to run Hermes, or will they acquire any of the competing ESD products that run on existing host or server-based operating environments?

Novell stands to gain the most from Microsoft's entry into — and "legitimizing" of — the ESD market. Novell became the EDS market leader with its 1992 acquisition of Annatek Systems, Inc. and has kept that lead through continual enhancements to its Network Navigator product family.

Network Navigator now runs on everything from IBM mainframes to DOS- and OS/2-based LAN servers, with support for Macintosh and Unix servers in the works.

Novell will continue to dominate the ESD market because, in the wake of NetWare 4.0, it is now regarded as an enterprise networking vendor. ESD is primarily an enterprise application that will be managed centrally in most companies. Novell's broad platform support for Network Navigator will continue to make it the strongest enterprise-oriented ESD vendor for the foreseeable future.

To cement its enterprise ESD strategy, Novell has been integrating ESD, ESL and inventory management capabilities with NetWare. A NetWare Loadable Module version of Network Navigator was released this past summer.

Of course, we shouldn't rule out a strong challenge from IBM, HP or any other ESD contender in 1994. Novell, with its proprietary ESD architecture, may find itself on the defensive if the Open Software Foundation, Inc.'s cross-vendor ESD standards gain widespread acceptance.

Anyway you look at it, the ESD industry is in for an exciting year in 1994. Many big-name vendors will be entering the ESD market or increasing their visibility in it.

From the network manager's point of view, one thing's for certain: You won't be able to get by without an ESD strategy much longer. It's high time you took your first serious look at this increasingly important technology.

Kobielus, a contributing editor to *Network World*, is a telecommunications analyst with Fairfax, Va.-based Network Management, Inc., a local- and wide-area network systems integrator. He can be reached at (202) 260-3331.

INTERNETWORKING

by Nathan Muller

Frame relay makes the connection

Internetworks that link local-area networks are rapidly shaping up as the preferred enterprise data network architecture. However, large-scale deployment of LAN internets across the wide area is becoming more complex than originally anticipated. The problem is that connectionless routing protocols used on LANs do not scale up well on large wide-area internets, which may consist of hundreds, or even thousands, of LANs interconnected by routers.

An alternative approach, connection-oriented routing via frame relay, can go a long way toward overcoming the many problems associated with connectionless routing protocols.

In the connectionless environment, each protocol employs its own route selection method through the WAN internet, making traffic flows difficult to manage. There is also no consistent way of responding to congestion when connectionless protocols are used. As the size of routing tables increases, the network becomes overly sensitive to changes in physical topology, rendering it unstable. And without a single, comprehensive tool for viewing traffic over the WAN internet, it is difficult to optimize networks for cost and performance.

Left unaddressed, this complexity can result in severe management, performance and cost penalties that are magnified as these WAN internets grow. These deficiencies can be overcome by simplifying router connectivity by using virtual circuits, which divorce the logical connectivity seen by routers from the physical topology that is susceptible to outages and reconfigurations. The end-to-end connection-oriented protocol offered by frame relay provides this virtual circuit capability.

One way to take advantage of the connection-oriented infrastructure is to subscribe to a public frame relay service. With routers interconnected through public frame relay services, the public network provides the necessary connectivity. However, there is a widespread perception that public data services still lack the robustness to be trusted with mission-critical data.

Another approach might be to implement the connection-oriented infrastructure as a private net using switching equipment and leased lines, over which routers would be interconnected throughout the WAN internet. This would allow organizations to tailor the size and capacity of the infrastructure to their needs.

However, this private network approach entails a separate network management scheme, imposes new operational support demands, potentially raises reliability problems, and adds equipment and support costs.

The optimal approach would be to integrate both routing and switching into the same platform to provide the connection-oriented infrastructure. With a single network fabric serving the WAN internet, the infrastructure and routers can be managed from a single platform. Configuration and operation of the overall network would be easier, and there would be fewer potential points of failure throughout the network.

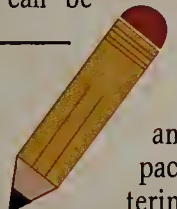
This close coupling of routing and network switching offers many other benefits for the WAN internet. Overall latency is reduced because data exchange between the LAN protocol and network-switching layers is performed within one software platform. This also makes traffic flow control and congestion management clean and efficient.

And because only one set of devices need be managed, maintained and configured, instead of two parallel networks, there are fewer vendors to deal with, as well as savings in equipment and support costs. The integrated approach also offers future migration to public data services based on Asynchronous Transfer Mode (ATM) technology.

The emergence of large-scale corporate WAN internets is creating problems that clearly cannot be addressed with existing LAN internetworking technology. An enhancement to router networks based on the existing connection-oriented network infrastructure, which supports the mapping of logical connectivity over the physical network, offers many advantages for WAN internets. All that is needed is a switching capability integrated into routers that serve the WAN internet.

➜ Muller is an independent consultant in Huntsville, Ala., who specializes in LAN/WAN internetworking. He can be reached via MCI Mail at 546-4889.

Letters



Proteon updates router data

The comprehensive Buyer's Guide chart for routers in your Sept. 27 issue did not include a number of significant features and capabilities — particularly in the area of Systems Network Architecture support — found in all routers manufactured by Proteon, Inc.

Proteon's CNX 600, CNX 500, CNX 400 and DNX 300 internetworking routers provide multiple levels of standards-based support for IBM's SNA, including support for IBM's Data Link Switching (DLSw) interoperability standard.

This November, Proteon will deliver DLSw support to select customers and expects to provide full support as part of an update in the first quarter of next year.

On another front, aggregate throughput for the CNX 600 is 100,000 packet/sec with the dual processor. With a single processor, both the CNX 600 and CNX 500 deliver 50,000 packet/sec. The CNX 400 delivers 25,000 packet/sec and the DNX is rated at 6,000 packet/sec. The CNX family's filtering and forwarding rates for Ethernet, token ring and Fiber Distributed Data Interface are at or near the line-speed limits. The CNX 600 lists for $16,900 to $22,000. The CNX 500 is priced between $9,995 and $14,235. The CNX 400 lists for $3,995 to $6,995, and the DNX 300 costs between $3,995 and $5,495.

The full Proteon family supports most major transport protocols identified by *Network World's* recent table, including Apple Computer, Inc.'s AppleTalk 1 and 2, Banyan Systems, Inc.'s VINES, IBM's SNA, Xerox Corp.'s Xerox Network Systems, Advanced Peer-to-Peer Networking (through DLSw), Digital Equipment Corp.'s DECnet IV and V, Novell, Inc.'s Internetwork Packet Exchange (IPX) and Transmission Control Protocol/Internet Protocol. Protocol Management Information Bases (MIB) supported throughout the Proteon internetworking family include IP, IPX, Point-to-Point Protocol (PPP), Open Shortest Path First (OSPF), DECnet and Routing Information Protocol (RIP). Interface MIBs supported include Serial, token ring, Ethernet and FDDI.

All Proteon internetworking products support the major bridging algorithms and Simple Network Management Protocol MIBs. In addition to wide-area network software capabilities such as frame relay, PPP and X.25, all Proteon routers support T-1/E-1 and fractional T-1 speeds, as well as X.21, V.35 Serial and Integrated Services Digital Network interfaces. Proteon routers support OSPF and IS to IS; they also support Exterior Gateway Protocol, RIP and Multicast OSPF. Distributed management capabilities across the product line range from an SNMP agent and proprietary support to a NetView agent (the company's SNMP to NetView gateway). All Proteon DNX and CNX routers provide remote configuration through Telnet and internal boot devices. The CNX 600 also has an internal modem for out-of-band access.

The DNX 300m and 300n provide ease-of-use features, connectivity and performance scaled for economical remote site connectivity. Aggregate throughput is 6,000 to 8,000 packet/sec. They forward 64-byte Ethernet packets at 6,000 packet/sec, and 1,518-byte Ethernet packets at 800 packet/sec. They forward 64-byte token-ring packets at 8,000 packet/sec and 4,096-byte token-ring packets at 490 packet/sec.

The DNX family's SNA support features include Synchronous Data Link Control pass-through, poll spoofing and SNA encapsulation in TCP/IP. The DNX 300n is list priced at $3,995 to $5,495. The DNX 300m lists for $4,995 to $7,995.

The p4100+ is designed for regional and departmental connectivity. Aggregate throughput is 5,000 to 7,000 packet/sec. It forwards 64-byte Ethernet packets at 4,000 packet/sec, 1,518-byte Ethernet packets at 800 packet/sec, 64-byte token-ring packets at 7,000 packet/sec and 4,096-byte token-ring packets at 8,000 packet/sec. The p4100+ is priced between $3,297 and $8,000. It also supports Apollo Token-Ring and ProNET-10 networks.

Thank you for allowing us to clarify our data.

Joe Grillo
Public relations manager
Proteon
Westborough, Mass.

Editor's note: The above information reflects information Proteon did not supply in the vendor survey conducted for the Sept. 27 Buyer's Guide.

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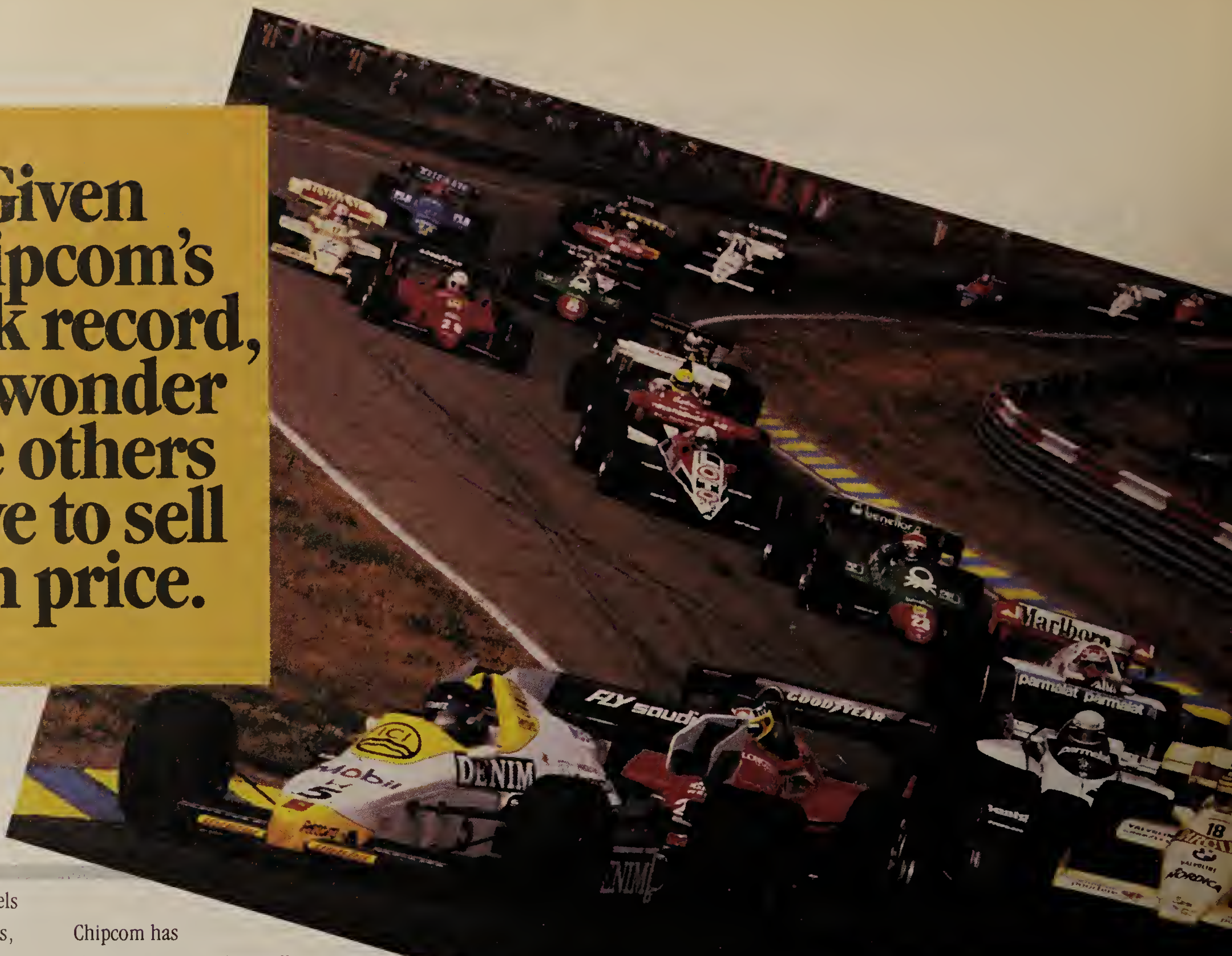

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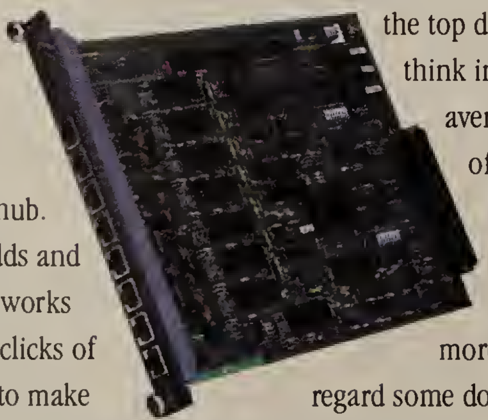

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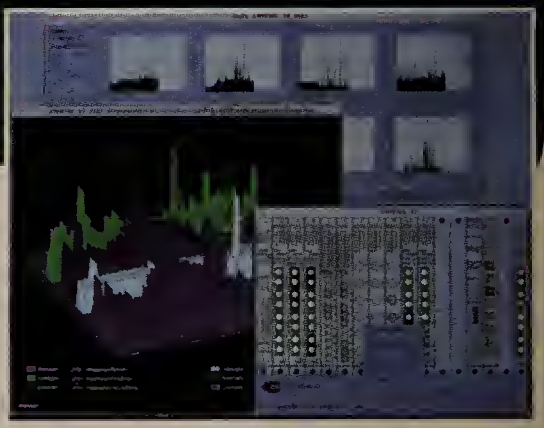

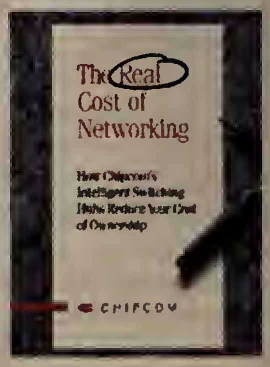

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SMDS: the silent contender

BY DANIEL BRIERE

With all the hype new high-speed data networking services such as Asynchronous Transfer Mode (ATM) and frame relay are getting today, Switched Multimegabit Data Service (SMDS) is often needlessly overlooked.

Network managers seem more enamored with frame relay's wide availability as well as its virtual private data network-like functionality and more entranced by ATM's promise of high bandwidth than with SMDS' ability to establish switched links among sites at native local-area network speeds. And many industry analysts say this is an unfair and unfortunate situation.

"SMDS provides a type of communications that frame relay will never provide, and is providing it before ATM can be deployed fully," says Thomas Nolle, president of CIMI Corp., a technology assessment consulting practice in Voorhees, N.J. "Users are missing an important new class of data service if they are not looking at SMDS."

SMDS is a connectionless, cell-switched data transport service designed for high-speed applications such as interconnecting LANs. Technical specifications for the service were developed at Bell Communications Research in Livingston, N.J., and are based on the IEEE 802.6 Metropolitan Area Network standard (see story, this page).

Because it was defined by Bellcore, the research arm of regional Bell holding companies, SMDS is thought of as primarily a local carrier service. And that largely holds true, making the purchasing decision really one of SMDS vs. alternative services, rather than one of stacking up one carrier's SMDS offering against another's.

Network managers connect to a carrier switch supporting SMDS via a Subscriber Network Interface (SNI), usually a T-1 or T-3 circuit. A T-1 SNI is used to access a 1.17M bit/sec SMDS offering, while a T-3 SNI is used to tap into 4M, 10M, 16M, 25M or 34M bit/sec SMDS offerings. A fractional T-3 circuit can be used to access intermediate-speed SMDS offerings.

Just recently, Bellcore released a Data Exchange Interface (DXI) specification that defines 56K and 64K bit/sec SNIs (see story, page 40). Bellcore is expected to issue specifications for a Synchronous Optical Network SNI operating at the Optical Carrier-3 rate of 155M bit/sec.

Essentially, SMDS chunks data packets of up to 9,188 bytes each into a series of 53-byte cells. Those cells are switched through the carrier's network to the destination site, where the original packets are reassembled.

Support for the CCITT E.164 addressing scheme enables users with a single SMDS SNI to establish a switched connection with any other site using an address that is similar to a telephone number, a feature known as any-to-any connectivity.

The Short List

- ✓ Bell Atlantic Corp.'s Bell Atlantic SMDS
- ✓ MCI Communications Corp.'s HyperStream SMDS

Complete details about The Short List appear on page 44.

High-end services provide the full breadth of speeds and features outlined in the SMDS specifications. They will also provide a choice of access equipment that can be bundled with the service and a range of network management capabilities that enable managers to track SMDS usage and performance.

Low-end offerings will support only a few speeds, a limited choice of bundled access equipment and basic network management options.

WHO'S GOT IT

Today, SMDS is offered by five of the seven regional Bell holding companies; Ameritech, Bell Atlantic Corp., BellSouth Corp., Pacific Telesis Group and US West, Inc. One independent local service provider, GTE Telephone Operations, also offers SMDS.

Southwestern Bell Corp. will roll out an SMDS offering but would not say when. Nynex Corp. has no intention of offering SMDS and is concentrating on rolling out ATM services instead.

RBHC competitors Metropolitan Fiber Systems, Inc. and Teleport Communications, Inc. are likewise eschewing SMDS for now. Each has its own native LAN connection service.

Ameritech, Bell Atlantic, BellSouth and US West all offer the full range of SMDS speeds. Pacific Telesis offers 1.17M, 4M, 10M and 16M bit/sec speeds only, while GTE supports a single speed — 1.17M bit/sec. Ameritech will be the first to offer SMDS via the 56K or 64K bit/sec DXI.

In general, SMDS is available for communications within a local access and transport area. Bell Atlantic has by far the broadest geographical coverage, with SMDS available in 12 major LATAs; Pacific Telesis and GTE also have fairly extensive availability. Still, the local

Continued on page 40

Defining SMDS

Switched Multimegabit Data Service (SMDS) is a connectionless, cell-switched data transport service designed for interconnecting local-area networks, host computers and workstations over a wide-area network with LAN-like performance.

SMDS is called connectionless because it obviates the need for carrier switches to establish a call path between two points before data can flow. Instead, SMDS access devices pass 53-byte cells to a carrier switch, which reads addresses and forwards cells one by one over any available path to the appropriate endpoint, just like in most LANs.

The protocols used in SMDS are based on the IEEE 802.6 metropolitan-area network specification, which is considered to be quite complete. However, SMDS is not a true metropolitan-area network as defined by IEEE 802.6. Rather, it is a subset of IEEE 802.6 developed at Bell Communications Research in Livingston, N.J.

SMDS defines a three-tiered architecture: a switching infrastructure comprising SMDS-compatible switches that may or may not be cell-based; a delivery system made up mostly of existing T-1 and T-3 circuits called Subscriber Network Interfaces; and an access control system for users to connect to the switching infrastructure without having to become a part of that infrastructure.

Taken together, SMDS' physical interface and transmission protocol descriptions are called the SMDS Interface Protocol (SIP). SIP includes two types of data packets — a Level 3 Protocol Data Unit (PDU) and a Level 2 PDU, which are supported by SMDS access devices.

The Level 3 PDU enables the access device to accept packets of up to 9.188K bytes each from a communicating device. The Level 2 PDU breaks those packets into a series of 53-byte cells that are sent to an SMDS switch, which forwards them to the destination site, where the Level 3 PDU is reassembled.

Bellcore set the Level 2 PDU size at 53 bytes to closely align it with ANSI and the Telecommunication Standardization Sector broadband Integrated Services Digital Network recommendations for Asynchronous Transfer Mode (ATM). SMDS and ATM cells are the same size and have compatible address/control headers, making migration from SMDS to higher speed services easy for customers.

SMDS offers a series of Sustained Information Rates (SIR), or operating speeds, that range from 1.17M to 34M bit/sec. SIR defines the average throughput that users can expect from an SMDS circuit over time.

BY DANIEL BRIERE

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carriers cannot offer an inter-LATA SMDS service. To cross LATA boundaries, net managers must purchase SMDS or a private line from an interexchange carrier or utilize a connecting interexchange service such as frame relay.

Only MCI Communications Corp. has come out with an interexchange SMDS offering. The company currently sells its HyperStream SMDS on a case-by-case basis and expects to make it more widely available in the first quarter of 1994.

MCI's service is available at speeds from 1.17M to 34M bit/sec. Interoperability with local exchange carrier offerings has been demonstrated.

While SMDS defines a Subscriber Interface Protocol (SIP) that enables SMDS to be encapsulated in frame relay, no carrier supports it yet. However, Sprint Communications Corp. says it will accommodate SMDS traffic by encapsulating it in frame relay (see sidebar, page 48).

SMDS deployment plans
Ameritech

Available now:
Champaign-Urbana, Ill.
Chicago
Detroit
Grand Rapids, Mich.
Upper Peninsula, Mich.
Appleton/Green Bay, Wis.
Milwaukee
Madison, Wis.
4Q '93-1Q '94:
Indianapolis
Ann Arbor, Mich.
Lansing, Mich.
Pontiac, Mich.
Saginaw, Mich.
Dayton, Ohio
Eau Claire, Wis.

AT&T has no plans at this time to offer SMDS and is instead pushing hard to launch ATM service next year.

THE REAL CHOICE

Because SMDS is available from local exchange carriers and only one interexchange carrier, there is no need to compare different offerings when picking an SMDS provider. The real choice comes in selecting SMDS over other high-speed alternatives such as frame relay and ATM.

Yet, it's hard to stack SMDS up against its high-speed alternatives because SMDS has been available for less than a year and has been installed by only a smattering of users.

One thing is clear, though: SMDS is the only high-speed connectionless data service available today. The connectionless nature of SMDS means data flowing between nodes does not have to follow a predefined path through the network, as does data in a connection-oriented environment such as frame relay.

Therefore, connectionless service acts like a public network service that enables a user at one site to essentially dial-up a link to a user at another site. Connection-oriented services require a user at one site to establish a virtual private circuit with a user at another site.

ATM can operate as a connection- or connectionless-oriented service, but early carrier implementations support connection-oriented operation only.

Network managers assume a migratory hierarchy of moving from frame relay to SMDS to ATM as their bandwidth needs increase. Frame relay is positioned in the 56K bit/sec to T-1 range; SMDS in the T-1 to T-3 range; and ATM generally takes over for everything above T-3.

"People rattle off SMDS, ATM and frame relay in the same breath, and it's not really appropriate because each of them meets different needs," says Paul Weichselbaum, MCI's vice president of data marketing.

When evaluating SMDS, net managers need to determine whether its performance matches application requirements, it matches the way workers communicate, it fits into the desired network topology, it comes bundled with access equipment and how it can be managed.

APPLICATION NEEDS

As a media access control (MAC)-level service, SMDS operates independently of network layer protocols. As such, SMDS is well suited to connecting remote LANs at their native speeds.

However, in order to provide interoperability between LANs over SMDS, the network layer protocols at either end must be implemented in the same manner or problems will result.

A set of standards for such interoperability has been developed by the SMDS Interest Group, a group of SMDS carriers, equipment makers and users that is defining a common SMDS implementation plan. SMDS Interest Group members have demonstrated interoperability between Transmission Control Protocol/Internetwork Protocol nets. New standards have been designed to enable SMDS to carry Novell, Inc.'s Internetwork Packet Exchange (IPX), Apple Computer, Inc.'s AppleTalk, Digital Equipment Corp.'s DECnet, IBM's Systems Network Architecture and Open Systems Interconnection traffic.

Frame relay supports most of the same LAN protocols as SMDS. But one current advantage SMDS has over frame relay is its multicast support for IPX and AppleTalk, which enables a single message to be transmitted to multiple end users.

SMDS can also support non-LAN protocols for such applications as IBM mainframe channel extension. US West recently unveiled an SMDS-based channel extension service that enables end users to connect mainframes with such remote peripherals as cluster controllers, high-speed tape drives and laser printers. US West has successfully tested the service at a distance of more than 1,000 miles.

Another application that is ideal for SMDS is instant image transfer. LP Thebault Co., a large commercial printer in Parsippany, N.J., uses two Bell Atlantic T-1 SMDS lines to send high-speed graphics images of such printed materials as advertisements to its clients.

"Our files range from 1M to 100M bytes, and in a pre-SMDS environment, we had the option of either an eight-hour modem transfer or Federal Express [Co.]," says Clif Valentine, vice president of marketing for the printer. "Neither was very responsive or timely."

SMDS deployment plans
Bell Atlantic Corp.

Available now:
Delaware
Baltimore
Altoona, Pa.
Harrisburg, Pa.
Philadelphia
Pittsburgh
Scranton/Wilkes Barre, Pa.
Delaware Valley, N.J.
Northern New Jersey
Norfolk, Va.
Richmond, Va.
Washington, D.C.
1Q '94:
Charleston, W.Va.

LP Thebault uses MultiAccess Corp. interface cards in its Apple Macintoshes, IBM-compatible personal computers and Sun Microsystems, Inc. SPARCstations to access SMDS. The two SMDS access lines enable the company to demonstrate the technology in action and has won it some customers who see the benefits of faster transactions.

Valentine says that it can take three to four weeks for a print job to close. Transmitting images via SMDS helps knock a few days off that cycle.

"When these ads involve products that bring in $1 million in sales a day, shaving off several days can mean millions of dollars in revenues," Valentine says.

LP Thebault never considered frame relay for this application because the service was not available in the local area when it was investigating alternatives. Private lines were also defeated because they could not provide the any-to-any form of connectivity the application required.

LET'S TALK INTERCOMPANY

Other users find SMDS' connectionless transport useful for intercompany communications. SMDS is used by the Systems Technologies and Resources (STAR) consortium to boost interaction between member businesses, schools and communities in Alabama.

STAR was put together at the behest of Samford Business School and RUST International Corp. to increase the flow of information as well as reduce networking, research and development, and training among members. STAR consists of Alabama Power Co, AmSouth Bank N.A., BellSouth Communications, Inc., Bell South Telecommunications, Blue Cross and Blue Shield of Alabama, BE+K, Inc. Harry G. Mouat Co., Inc., Protective Life Corp., Samford Business School, Sonat Services, Inc., Southern Research Institute, the University of Alabama at Birmingham, and RUST International.

The first phase of the STAR SMDS network is being installed. Consortium members say the network will provide a better way to communicate with each other via X.400. The network will also make it easier to transfer files and share databases, says Bill Hart, director of Samford University's computer intensification learning service.

"BellSouth and Alabama Power share utility poles, for instance," Hart says. "This technology will allow them to access shared databases for tracking, maintenance and other informational needs."

The group is using SMDS routers from Wellfleet Communications, Inc. and 3Com Corp., and SMDS data service units (DSU) from ADC Kentrox and Digital Link Corp.

Hart says a major reason the group went with SMDS was to obtain its mesh connectivity and ease of management. With SMDS, all of the organizations connect via a single SNI to a carrier's SMDS switch and communicate freely, thus obviating the need for an expensive private line or a multitude of frame relay permanent virtual circuits (PVC) to one anothers' site. SMDS also eliminates the onerous task of managing network addresses and routing tables.

"Anyone looking at SMDS needs to understand how they communicate with other people," Hart says. "I think a lot of people could interface with other firms a great deal more than they do now if the proper tools, like SMDS, were in place."

SUITABLE CONNECTIONS

STAR's commitment to SMDS shows faith in the concept that connectionless transport is suited for interenterprise communications. New sites can be added to an SMDS net without totally reconfiguring the network. Additions to an SMDS network require a simple update to a screening database on the SMDS switch.

The screening database is a traffic filter that ensures an SMDS site receives messages from only those senders who have been designated as valid communicating partners. Network managers tell the carrier what to screen and the carrier plugs that information into the SMDS switches. The combination of connectionless service and screening make SMDS suitable for large networks.

"The value of a connectionless service grows exponentially as the number of users and sites grows," says US West's Joseph Zell, director of advanced communications services. "One value in connectionless services is that they bring users onto the network who would not be able to be on the network otherwise."

Because each SMDS cell contains E.164 addressing information, SMDS cells can be released into the public network delivery system just like letters get dropped off at the post office. Like letters, the cells find their way through the delivery channel without the need for predesignated paths.

SMDS deployment plans
BellSouth Corp.

Available now:
Atlanta
Birmingham, Ala.
Charlotte, N.C.
Nashville
4Q '93:
Miami
1Q '94:
Huntsville, Ala.

"SMDS is a kind of high-speed data version of plain old telephone service," says Joe DiPeppe, SMDS product manager at Bell Atlantic. "If you know someone's SMDS

Continued on page 44

Low-speed SMDS access

In a move to extend Switched Multimegabit Data Service to low-volume sites and broaden the service's appeal, Bell Communications Research has issued two technical advisories for low-speed access to SMDS.

Generic Requirements for Low Speed SMDS Access, TA-TSV-1239, Issue 1, and Frame Relay Access to SMDS, TA-TSV-1240, Issue 1, define 56K and 64K bit/sec SMDS access rates.

TA-TSV-1239 uses a Data Exchange Interface (DXI) to encapsulate SMDS within a frame format for access to an SMDS switch. Using a DXI avoids cell overhead on low-speed access lines and offers similar efficiencies as frame relay, says Paul Weichselbaum, MCI Communications Corp.'s vice president of data marketing. Thus, customers will be able to use a frame relay permanent virtual circuit at one location and SMDS access at another.

TA-TSV-1240 basically does the same thing but uses the Subscriber Interface Protocol to encapsulate SMDS data within a frame relay frame rather than fragment it into cells. The DXI encapsulation method will likely be implemented first, and carriers say there has been little interest shown in using frame relay to access SMDS sites at this point.

The low-speed access not only cuts costs on the access side, but also on equipment, as well. Non-SMDS-compliant data service unit/channel service units (DSU/CSU) may be used, translating into a $1,000 to $2,000 expense vs. about $4,000 for an SMDS-compatible DSU/CSU.

BY DANIEL BRIERE

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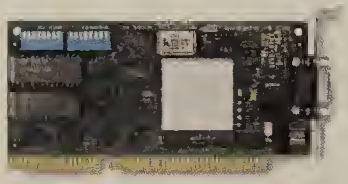

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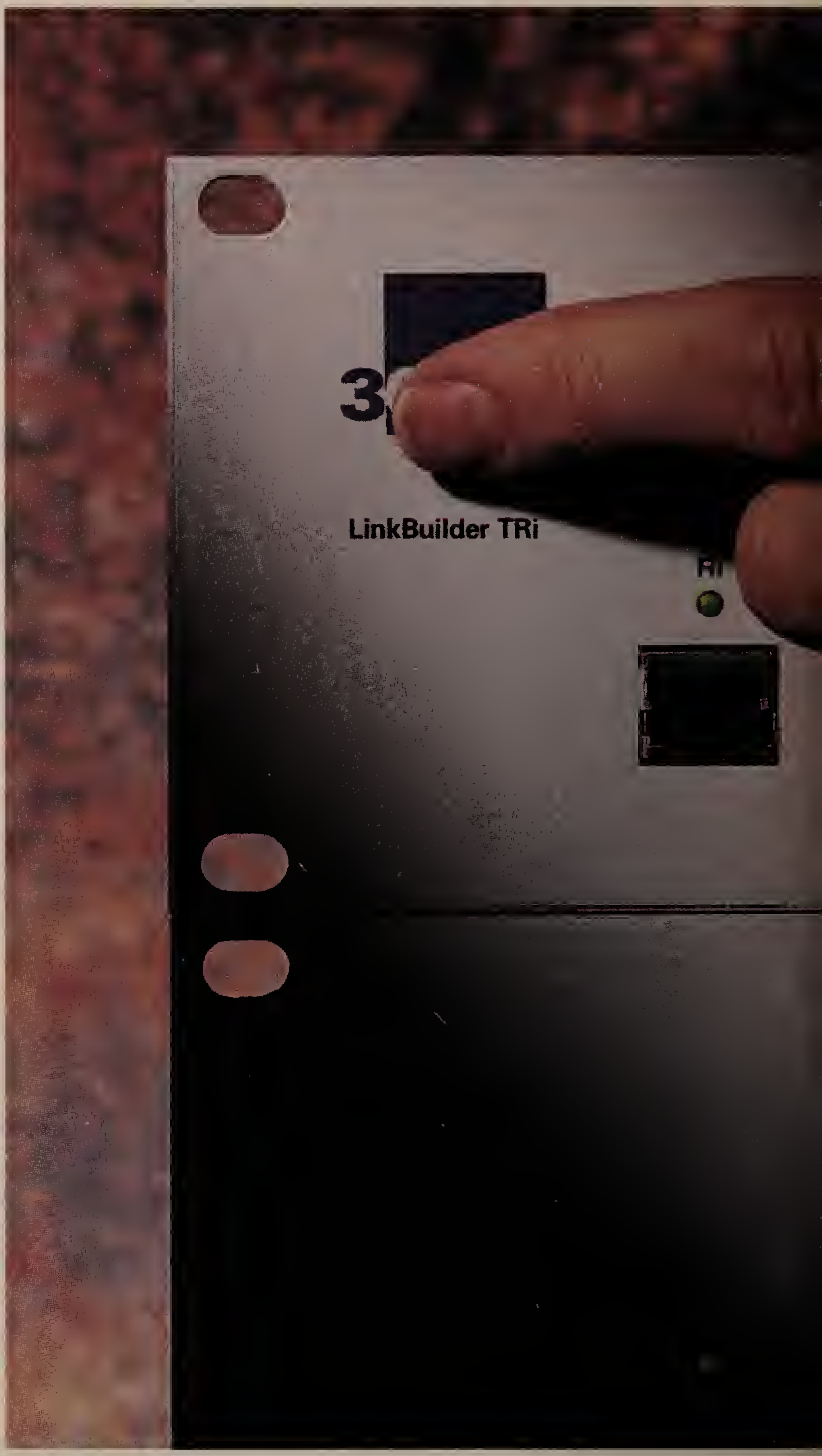

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Switched Multimegabit Data Services

Company	Product	Service speeds (M bit/sec)						Type of access	Features					Max. packet size (K bytes)	Type of net mgmt.	Tariff options	Tariffs filed	Carrier-provided CPE	CPE financing	Number of SMDS customers	SNIs	Pricing					
		1.17	4	10	16	25	34	0 = DS0 via DXI 1 = DS1 3 = DS3	Any-to-any connectivity	Multicasting	E.164 addresses	Call screening, validation, blocking	Multiprotocol support		D = Diskette P = Paper reports S = SNMP agent T = Terminal	GP = General public tariff U = Untariffed service	F = FCC tariffs S = State tariffs	A = Adapter B = Bridge D = DSU/CSU R = Router	C = Carrier financing L = Leasing P = Purchase without financing	Installed/contracted	Installed/contracted	Usage-based	Bundled equipment rental	Flat rate per month per link	Nonrecurring setup (per link/per account)	Group addressing	Other
Ameritech (800) 832-6328	Ameritech SMDS	✓	✓	✓	✓	✓	✓	0, 1, 3	✓	✓	✓	✓	✓	9.188	S	U		D, R	C, L, P	(1)	(1)		✓	ICB	ICB	$20/ mo. (2)	
Bell Atlantic Corp. (800) 442-0455	Bell Atlantic SMDS	✓	✓	✓	✓	✓	✓	1, 3	✓	✓	✓	✓	✓	7.168	S, T	GP	F, S	A, B, D, R		50/25	100+/ 65			$415-$4,000	$1,000-$2,000	(3)	Additional addresses per line: $5/mo.; SMDS "Disaster Recovery Lines": $375-$2,000 per line/mo.
BellSouth Corp. (404) 529-6757	SMDS	✓	✓	✓	✓	✓	✓	1, 3	✓	✓	✓	✓	✓	9.188	T	GP	S		(1)	(1)	(1)			$450	$600-$700	$5/ mo.	Additional addresses: $3/mo.
GTE Telephone Operations (214) 718-5212	Mega Connect	✓						1	✓	✓	✓	✓		9.188	S	GP (4)	S	D, R	C, L, P	5/2	15/6			$600-$700	$700-$1,000	$25/ mo.	
MCI Communications Corp. (800) 933-9029	Hyper-Stream SMDS	✓	✓	✓	✓	✓	✓	1	✓	✓	✓	✓	✓	9	P, S	U		B, D, R	C, L	(1)	(1)	✓		ICB	ICB	ICB	
Pacific Telesis Group (510) 867-7418	SMDS	✓	✓	✓	✓			1, 3	✓	✓	✓	✓	✓	9.088	D	GP	F, S	D, R	L	18/4	119/ 33			$600: DS1; $1,100-$1,700: DS3	$375: DS1; $3,500: DS3	$10/ mo.	Traffic detail: $15/mo.
US West, Inc. (800) 328-2879	SMDS	✓	✓	✓	✓	✓	✓	1, 3	✓	✓		✓	✓	9.188		GP	F, S	D, R	P	(1)	(1)			$448-$3,998	$790	$50/ mo. (5)	Central office connecting channel: $1; additional addresses: $50/ address

Products highlighted by color were selected for The Short List.

FOOTNOTES:

(1) Carrier would not provide this information.
(2) Ameritech also charges a $50 installation fee.
(3) Bell Atlantic offers this feature at no charge.
(4) GTE also offers Mega Connect on an ICB.
(5) US West also charges a $75 installation fee.

CPE = Customer premises equipment
DSU/CSU = Data service unit/channel service unit
DXI = Data Exchange Interface
ICB = Individual case basis
POP = Point of presence
SNI = Subscriber network interface

SOURCE: TELECHOICE, INC., VERONA, N.J.

Continued from page 40

address, you can call up and begin sending and receiving data."

This ease-of-use is admired by users. "Previously, I would spend my time designing complex multiplexing schemes and backup scenarios between sites [on our private network]," says Frank Mooney, director of network technologies for Blue Cross & Blue Shield of Maryland (BCBSM).

"Our business strategy is not to maintain a complex private T-1 network," Mooney says. "We utilized the flexibility of SMDS and created a plug-and-play utility to support our current and future business systems."

BCBSM uses two Cisco Systems, Inc. 7000 routers, four Cisco AGS routers, and three Cisco 4000 series routers in conjunction with ADC Kentrox DSUs to access SMDS network circuits that interconnect seven intra-LATA locations and one external business partner. The network supports multiple protocols, including IPX/Sequenced Packet Exchange (SPX), Network Basic I/O System and SNA, as well as such applications as electronic mail, imaging and claims processing.

SMDS deployment plans
GTE Telephone Operations
Available now:
Dallas
Everett, Wash.
Los Angeles
Tampa, Fla.
4Q '93:
Honolulu

Frame relay is connection-oriented, meaning that a connection between two points needs to be set up prior to establishing a data session. As it is now, a device must have a separate PVC for each other device it will be able to reach. A frame relay switched virtual circuit (SVC) will improve the situation by enabling users to essentially dial up a connection to another device. But even an SVC will be connection-oriented, requiring data between devices to follow an established path.

PVCs and SVCs need to be defined in frame relay switch routing tables. Each time a PVC or SVC is changed or added, the routing table of each switch needs to be adjusted, a time-consuming process. Thus, frame relay is better suited for intraenterprise communications that require infrequent modifcations.

The situation is no better in a private-line network where all connections are hardwired. Changing those connections, even with today's digital access and cross-connect system technology, is time-consuming.

Another benefit of connectionless serivce is that it does away with the need for precise traffic-flow predictions between locations. With no predefined path between devices, data can travel over the least congested routes in an SMDS net. Frame relay requires all traffic to flow across a specific path, thus forcing network managers to examine traffic patterns and provide adequate capacity.

SMDS' connectionless nature also makes it easier for users to build full mesh networks in which each site is connected to each other site. And SMDS has been priced to encourage mesh networking. For example, 20 SMDS sites essentially cost as much as 30, as long as each site does not have to increase its access speeds to accommodate the new sites.

SMDS is generally a fixed-price service, meaning that it has no mileage cost or usage component. This pricing makes SMDS attractive where the distance between sites and usage are high. CIMI's Nolle estimates that the break-even point for SMDS is between three and four sites.

This is borne out in at least one case. In Bell Atlantic territory, SMDS starts looking good when three to four sites that are an average of 10 to 12 miles apart need to be linked, says Mara Spaulder, manager of fast packet services for Bell Atlantic. "As mileage or connections increase, SMDS looks all the better," she says.

This differs from frame relay, which has a scaling factor and increases in cost as a user designs for full mesh networking. Thus, frame

Continued on page 48

The Short List
SMDS

The Short List highlights products Network World *recommends you examine during the purchasing process for Switched Multimegabit Data Service. While most carriers offer the full lineup of SMDS speeds and features spelled out in the standards, those in this Short List have more experience in providing SMDS or offer unique services.*

■ **Bell Atlantic Corp.'s Bell Atlantic SMDS.** Bell Atlantic is the only RBHC with dual network management options: It will send SMDS management data to a user's SNMP-based workstation or give the user a terminal to tap into its internal management system. Also, with more than 50 customers, over 100 SMDS connections and service in 12 LATAs, Bell Atlantic has more experience with SMDS than any other carrier.

Bell Atlantic also offers a trial program that enables users to test SMDS without investing in new equipment. The carrier provides SMDS bridges, routers, data service unit/channel service units (DSU/CSU) and adapters free for three months to users that pay for three months of service. Finally, the RBHC offers a disaster recovery program for SMDS, allowing for even greater service reliability.

■ **MCI Communications Corp.'s HyperStream SMDS.** MCI is the only interexchange carrier to get serious about SMDS by including it as a strategic part of its overall data services portfolio, which should ease users' minds that MCI won't abandon it when higher speed services such as Asynchronous Transfer Mode come along. The carrier also offers a broad range of equipment options that include leasing and financing for bridges, routers and DSU/CSUs. Lastly, it's the first carrier to offer usage-based SMDS pricing.

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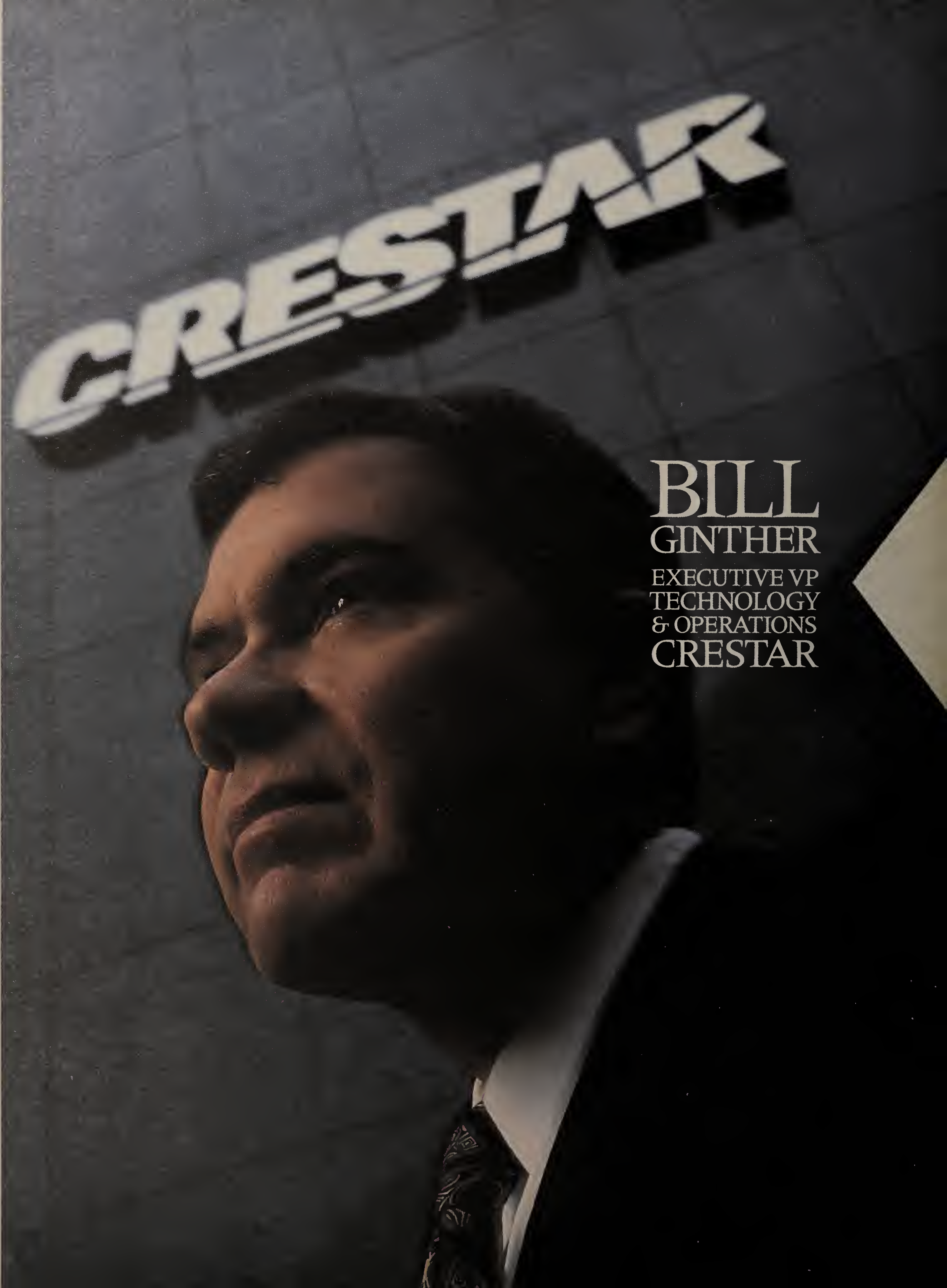

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Continued from page 44

relay is a better choice for connecting only a few sites.

There is one problem with connectionless; many managers are still designing star, protected star and ring networks that operate best in connection-oriented environments, according to US West's Zell. Those designs make SMDS look exorbitant in cost compared with frame relay.

US West has addressed this by modifying pricing to match the way customers think, with low-, medium- and high-connection pricing. This makes SMDS pricing fall more in line with frame relay, rather than the any-to-any pricing.

EQUIPMENT NEEDS

Even linking into the connectionless SMDS network is more straightforward than tapping into the connection-oriented services. But the required equipment can be expensive. Accessing SMDS via a T-1 SNI requires a fast router card sporting an RS-422 interface as well as a $4,000 SMDS channel service unit (CSU)/DSU that breaks data packets into SMDS cells. Accessing SMDS via a T-3 SNI requires a $5,000 High Speed Serial Interface (HSSI) card for the router and a $10,000 to $12,000 SMDS CSU/DSU.

SMDS deployment plans

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Connecting to SMDS via the DXI, however, is not as expensive. Users can utilize less costly frame relay access devices to provide lower speed interconnectivity to an SMDS net.

Frame relay access equipment consists of a card with a V.35 interface for a router — something most customers already have — as well as a cheap or free software upgrade and a basic CSU/DSU. The equipment needed to access frame relay at 56K bit/sec costs about $600 while equipment supporting T-1 access is about $1,200.

The higher cost for SMDS equipment is all part of the equation, managers say. John Gilboy, manager of data center services for the California State Automobile Association (CSAA) in San Francisco looked at several other options, including a fractional T-1 net, but found the cost would be roughly the same as SMDS.

"We understand that we are spending more money up-front than is required to run today's network," Gilboy says. "But we also know that a year from now, we're going to be exploiting the capacity and capabilities of SMDS."

CSAA tapped SMDS to replace a low-speed multidrop net that covered nearly 100 locations across California. Cisco's 4000 series routers and Digital Link's DL2000 SMDS DSU/CSUs provide access to Pacific Bell 1.17M bit/sec SMDS links that shuttle membership, insurance claims and other data between the CSAA mainframe and remote IBM 3270 terminals or NCR Corp. workstations.

"We decided there weren't any business advantages to maintaining our own network, and SMDS relieved us of that responsibility," CSAA's Gilboy says.

Jerry Wayock, vice president of network services for Meridian Bank in Reading, Pa., was able to save a tremendous amount of money with an SMDS implementation, despite the higher cost of equipment. Meridian has 12 SMDS circuits connecting 10 locations. The bank had been using 56K bit/sec dedicated lines to handle several applications, including LAN interconnection, IBM token-ring traffic and connections to a DEC VAX, but there just wasn't enough bandwidth.

Meridian looked at a private T-1 network and SMDS. "The 56K bit/sec dedicated links cost us $15,000 a quarter," Wayock says. "A T-1 net would have cost $36,000, but SMDS came in at only $21,000."

Wayock recommends customers get equipment on loan from vendors or carriers to test SMDS. "That way, you get to find out how committed each vendor is to your account and to SMDS," he says.

Bell Atlantic has a loaner program in which users get equipment free for three months in exchange for paying for three months of SMDS serivce. All of the 15 companies that have tried the program have ended up purchasing SMDS, Bell Atlantic's Spaulder says.

Bell Atlantic also has a trade-in program that lets users swap out low-speed access equipment for higher-speed equipment by paying the difference between the old and new equipment.

Carriers are also bundling equipment with SMDS. Most carriers offer leases for DSU/CSUs. Others will sell DSU/CSUs, adapters, bridges and routers. Some carriers, such as GTE and Ameritech, offer financing for equipment as well as leasing and outright purchase options.

A mix of service management options are emerging, too. Bell Atlantic and BellSouth offer terminals that enable users to tap into their internal SMDS management systems and view limited traffic statistics. Ameritech and Bell Atlantic offer Simple Network Management Protocol-based customer network management systems that enable network managers to monitor SMDS traffic on their own SNMP workstations.

Some network management issues are still being worked out in the SMDS Forum, though. "We have not really determined whether to give end users the ability to change the screening [database on SMDS switches] because it may involve lessening the tight security that screening provides," Spaulder says.

SMDS deployment plans

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MCI and Sprint offer paper-based reporting, as well, a significant tool in assessing what traffic is actually flowing over the network.

The same type of management options are offered with SMDS' high-speed alternatives.

IS THE PRICE RIGHT?

When everything else is said and done, pricing will determine SMDS' success.

SMDS charges usually consist of installation fees plus a flat monthly rate for a given port speed. Installation fees are $375 to $1,000 per T-1, and $2,000 to $3,500 per T-3. Monthly costs run $400 to $700 per T-1 link, and $1,800 to $4,000 per T-3.

The access fees are reasonable given that SMDS is not available universally and the carriers are absorbing backhaul charges in many instances. CIMI's Nolle estimates that the buy-

Reader views on Switched Multimegabit Data Service

Based on 50 interviews

Readers cast their ballots on SMDS

Those in favor:

"I much prefer SMDS over frame relay: SMDS is more technically elegant and provides a better solution for LAN internetworking requirements."

"SMDS is of the same quality as T-1, but it is less expensive. We want to pay by the percentage of utilization, but US West will not bill that way."

"We prefer SMDS over switched 56K bit/sec circuits because of the connectionless aspect, the extra bandwidth and the ease of running our graphics applications."

"We have two buildings connected by Ethernet. We are very satisfied with SMDS because we had expected throughput slow downs but they did not occur."

Those opposed:

"We have a primary computer center and its T-1s are sufficient. SMDS probably won't be competitive for another two years. I doubt SMDS's ability to provide intercompany switched connections because of security and accounting problems. Frame relay is distance-sensitive in pricing: It is more cost-effective."

"ATM seems to be the next jump. ATM offers more flexibility and the possibility of interconnectivity between LANs and WANS without much conversion."

"We were part of an experiment conducted by Bell of Pennsylvania. When they began billing at the end of a three-month period, they charged a straight tariff of $600 per month regardless of distance. We deal close to home, so we found it cheaper to use T-1 services."

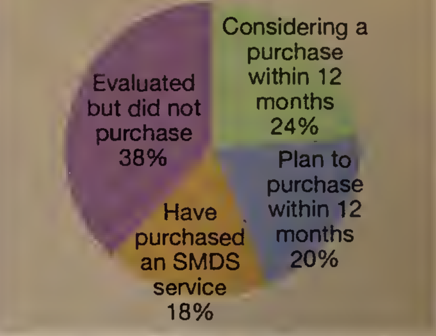
Those abstaining:

"Pricing policies need to be attractive. Who offers the most bandwidth for the dollars? It needs to be priced 20% to 40% below leased-line rates to be considered attractive."

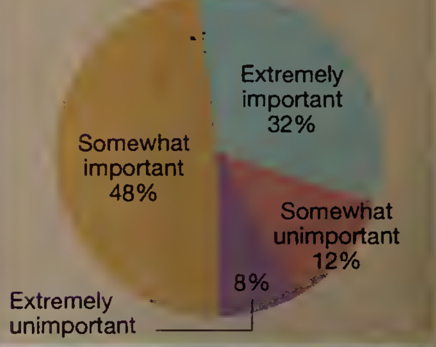
"It depends on the supporting of synchronous traffic. Any solution we adopt must have a cover-level mechanism and a top cell transport level."

"SMDS has a market niche today, but it is still too new. SMDS will become a more viable alternative as more high bandwidth applications and more traffic are routed out onto the network. Our engineering group determined that SMDS was not viable in 1993, but we will reevaluate the service in 1994."

Evaluation & purchase intentions



How would you rate SMDS's arguably uncertain future as a factor in your purchase decision?



SMDS service selection criteria

Based on highest possible score of 10

Criterion	Importance rating
Service and support	9.10
Price	7.20
Ability to establish intercompany switched connections	7.06
Flat rate billing structure	7.00
Use of connectionless protocol	6.56
Availability of sub-T-1 bandwidth	6.26

The graphics on this page depict key findings of a recent *Network World*/Focus Data, Inc. reader service on SMDS services. Focus Data, an independent market research firm in Framingham, Mass., conducted the survey, based on 50 interviews, and tabulated the results. Focus Data can be reached at (508) 626-2556.

GRAPHIC BY SUSAN SLATER

Interexchange SMDS

Switched Multimegabit Data Service has been pursued more quickly by the local exchange carriers than the interexchange carriers, resulting in a temporary vacuum for long-haul SMDS. Because local carriers cannot carry traffic across local access and transport area boundaries, they must depend on interexchange carriers to carry SMDS between LATAs.

So far, only MCI Communications Corp. has stepped forward to support native long-haul SMDS. Users buying into MCI's HyperStream SMDS merely send SMDS data into the local carrier's SMDS net. The local carrier's SMDS switch reads the address, recognizes it as destined outside the local area and sends it through a gateway to MCI.

Sprint Corp. has a different approach. The carrier will use its frame relay network to provide long-haul SMDS interconnectivity. Sprint will encapsulate SMDS cells received from local carriers in a frame relay frame for transport. However, when SMDS traffic is encapsulated in a frame relay frame, the user loses all the benefits of SMDS, such as global addressing, which enables a single message to be broadcast to multiple recipients.

AT&T will not be offering SMDS service anytime soon.

Aside from the MCI and Sprint solutions, end users can simply carry SMDS across LATA boundaries over unchannelized T-1 and T-3 long-haul circuits. This is possible because SMDS is a local-area network-like technology. Therefore, just as Transmission Control Protocol/Internet Protocol traffic can be routed across leased lines, an SMDS router is able to shuttle SMDS traffic over leased lines.

But using leased lines can take away SMDS' price benefit as well as its anywhere-to-anywhere connectivity. On the plus side, it enables customers to link SMDS islands.

BY DANIEL BRIERE

in threshold for SMDS for low-speed 56K bit/sec SMDS could be as low as $150 per month.

Usage-based SMDS pricing is now being discussed among local exchange carriers, but no one is sure exactly what shape it will take.

"The idea with usage-based pricing is that it gets customers away from having a fixed expense each month, and that can be critical for firms that have cyclical needs or simply want pay-as-you-go-service," US West's Zell says.

However, the market realities dictate that SMDS will have to build more of a following before usage-based pricing is offered.

"Truthfully, we've got to get over the hurdle of simply selling SMDS before we start thinking about those sorts of improvements," says one SMDS product manager who requested anonymity.

Today, MCI is the only carrier with usage-based pricing. "I'm not sure if the RBHCs are going to be as aggressive as MCI in pushing usage-based pricing," MCI's Weichselbaum says. "MCI already comes from that environment with frame relay and other services, so it is easier for us to implement."

The cost of access circuits is another big issue with SMDS, especially at T-3 speed. However, users needing that much bandwidth can probably swallow the high cost.

To help out users, US West offers a special T-3 SMDS access line for $463 a month, which is about a third of the cost for a full fare T-3 access line.

MOVING ON UP

Network managers that settle on SMDS as a solution for today's networking woes could also be positioned for a smooth migration to ATM. SMDS and ATM cells are both 53-bytes long and have compatible address and control headers.

"Users should see no equipment difference in using [Class D connectionless] ATM services vs. SMDS," Nolle says. "However, those who want to use other [connection-oriented] classes of ATM will probably have to expect hardware changes. This is particularly true if the user wants ATM-based voice or video."

Tac Berry, vice president of marketing for Digital Link, a manufacturer of DSU/CSUs, says his product will be software upgradeable to the new ATM framework for a marginal cost of about $1,500.

For some, seeing is believing. "I am still not convinced that SMDS [transported over Class D] ATM will be as seamless as projected," says Bill Horst, chief of the communications branch for the General Services Administration, the first implementor of SMDS.

Other users are not as worried. "I believe SMDS will flow very nicely over ATM once the carriers offer services to interconnect the two," says Ted Sickles, manager of data networks for Rockwell International of Seal Beach, Calif. "The specific problem right now, however, is the cost of local access to connect the services."

SMDS ON PARADE

Today, SMDS is still coming out of its shell. Carriers report they have more than 100 customers and more than 300 access lines installed.

SMDS is truly an enabling technology, as CSAA's Gilboy has learned. The firm is looking to SMDS as the transport vehicle for its client/server computing plans. Next year, the company plans to move several applications from its host to servers in offices around California.

Other end users are likewise expanding service. Meridian Bank will be adding 16M bit/sec circuits at headquarters to replace three T-1s there now and will look to replace 9.6K bit/sec branch connections with 56K bit/sec DXI links.

The bank will also be installing MCI interexchange SMDS next year, although Wayock says he has some concerns about that. "I'm concerned about some of the coordination issues," he says. "MCI uses variable speeds and sub-T-1 rates. There needs to be sufficient clocking and buffering to handle the different speeds. I want there to be no delays with the timing handoff from one network to the other."

In all, SMDS seems to be getting past the hurdles that have held back Integrated Services Digital Network for so long — lack of availability, high equipment prices and a really bad image.

Still, many users are confused as to where frame relay fits with SMDS, and the two with ATM. Education will still be key. In the end, SMDS may come out a silent winner.

➾ Briere is president of TeleChoice, Inc., a Verona, N.J., consultancy specializing in strategic planning and analysis of intelligent networks, services and applications. He can be reached at (201) 239-0700 or on MCI Mail at dbriere (445-4690).

Help desk

Continued from page 2

(SLIP) for Sun Microsystems, Inc. workstations.

John Brady, a network management consultant for SunNetworks, a business unit of Sun Microsystems, Inc., in Chelmsford, Mass., responds:

Your best source of installation instructions is your dial-up IP software supplier. Dial-up IP implementations based on SLIP and Compressed SLIP (CSLIP) are being replaced by new software based on the Point-to-Point Protocol (PPP) standards so if you are considering SLIP you should also look at PPP products.

SLIP, CSLIP and PPP software for Sun workstations is available either as freeware or as a fully supported commercial product.

The advantages of commercial products are technical support, easy installation and support of high-speed communication lines (most free implementations can only support speeds up to 38.4K bit/sec).

A popular free release of SLIP and CSLIP with installation instructions for many Unix machines is cslip-2.7.

You can pick it up on the Internet with anonymous File Transfer Protocol (FTP) from ftp.ee.lbl.gov. A widely-used free version of PPP is dp-3.0, and you can get it with anonymous FTP from phoenix.acn.purdue.edu.

The best source for help with free dial-up IP products are members of the Usenet news groups comp.protocols.ppp and comp.protocols.tcp-ip.

Freeware dial-up IP packages are best left to the experienced Unix user because installation requires compiling source code and modifying the Unix kernel.

If you prefer a commercial product, you might want to consider PPP-SP from Morning Star Technologies, Inc. or Sunlink PPP from SunSelect, a Sun business unit.

You can purchase Morning Star's PPP-SP, which supports SLIP, CSLIP and PPP, for $795 or Sunlink PPP through SunExpress, Sun's catalog sales business, for $995.

For information about PPP-SP, call Morning Star at (800) 558-7827, and for information about Sunlink PPP, call SunExpress at (800) 873-7869.

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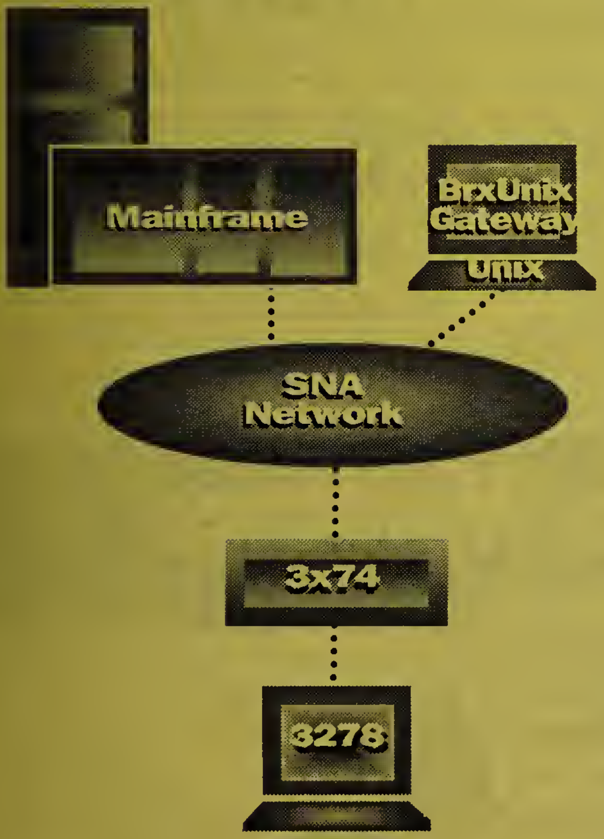

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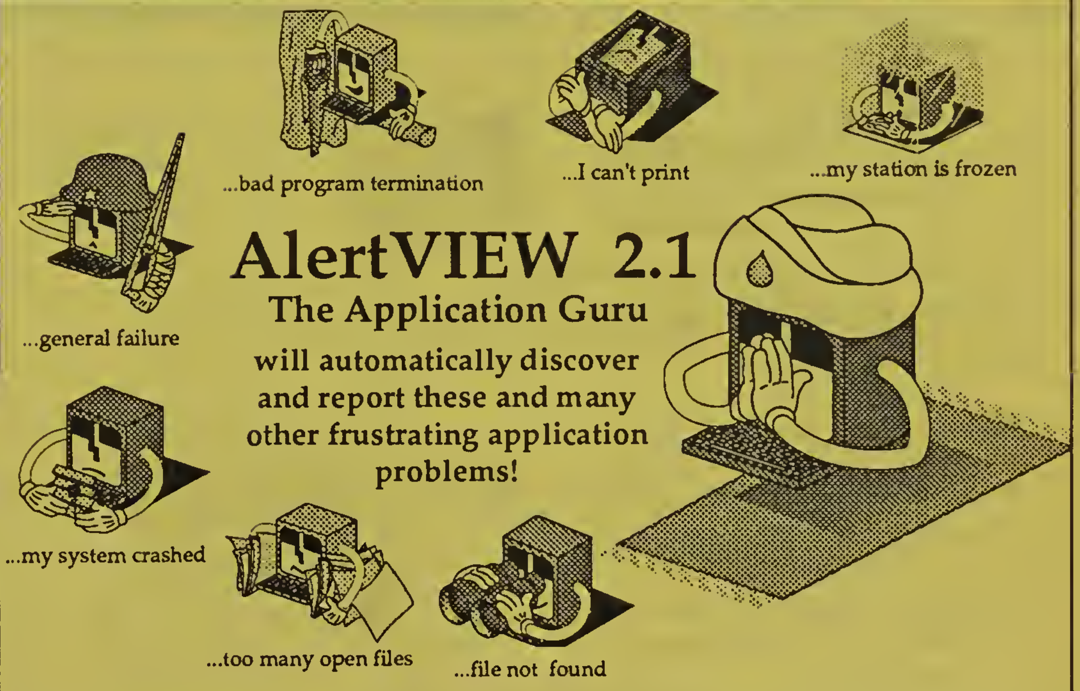

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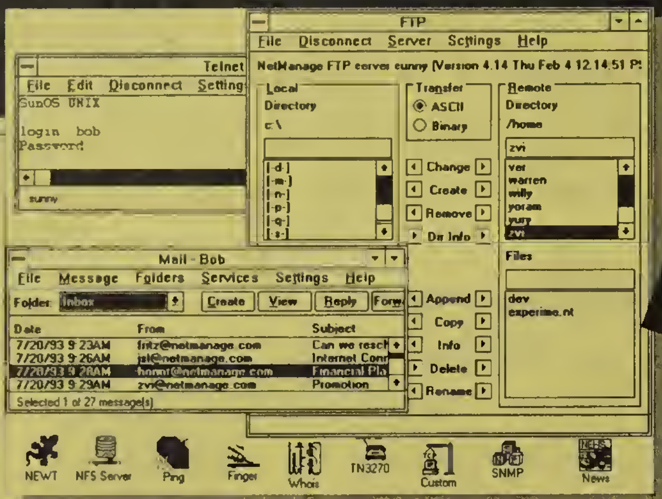
Telnet
SunOS UNIX

login bob
Password

FTP
NetManage FTP server sunny (Version 4.14 Thu Feb 4 12:14:51 P!
Local Directory c:\
Transfer ◉ ASCII ○ Binary
Remote Directory /home

Mail - Bob
Folder: Inbox

Date	From	Subject
7/20/93 9:23AM	fritz@netmanage.com	Can we resch
7/20/93 9:26AM	jsl@netmanage.com	Internet Conn
7/20/93 9:28AM	hormt@netmanage.com	Financial Pla
7/20/93 9:29AM	zvi@netmanage.com	Promotion

Selected 1 of 27 message(s)

- All applications are both client and server
- Works concurrently with NetWare, LAN Manager, Vines, etc.
- Up to 128 simultaneous sessions

Applications:

TELNET (VT100, VT220), TN3270, FTP, TFTP, SMTP/Mail, News Reader, POP, SNMP, Ping, Bind, Finger, Whois, Statistics, and Custom

Developer Tools:

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- ONC RPC/XDR
- WinSNMP API

May 1993

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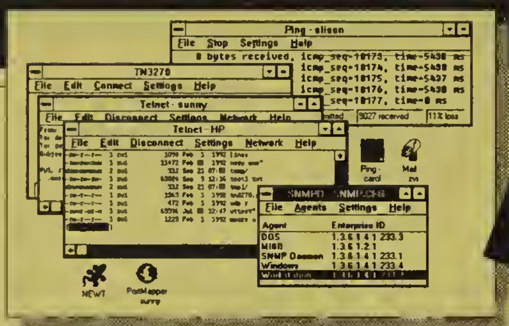
SNMP for Windows



May 1993

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- Dynamic registration of multiple agents, managers, and proxies
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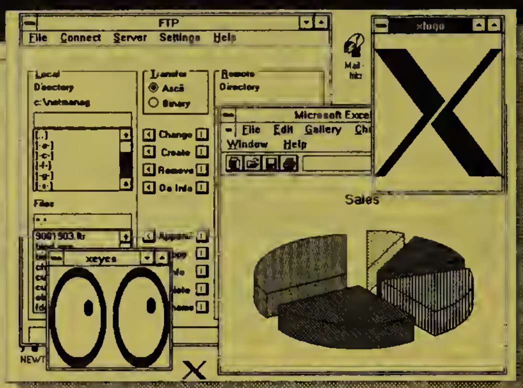

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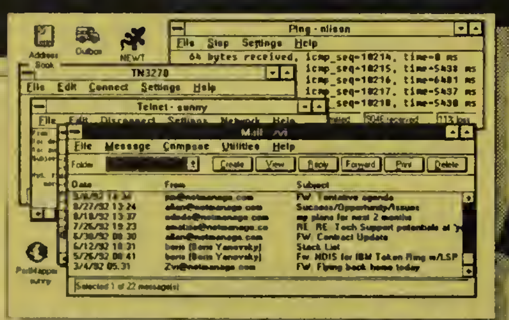
SMTP Mail for Windows



May 1993

- Direct access to SMTP/Unix mail from Windows
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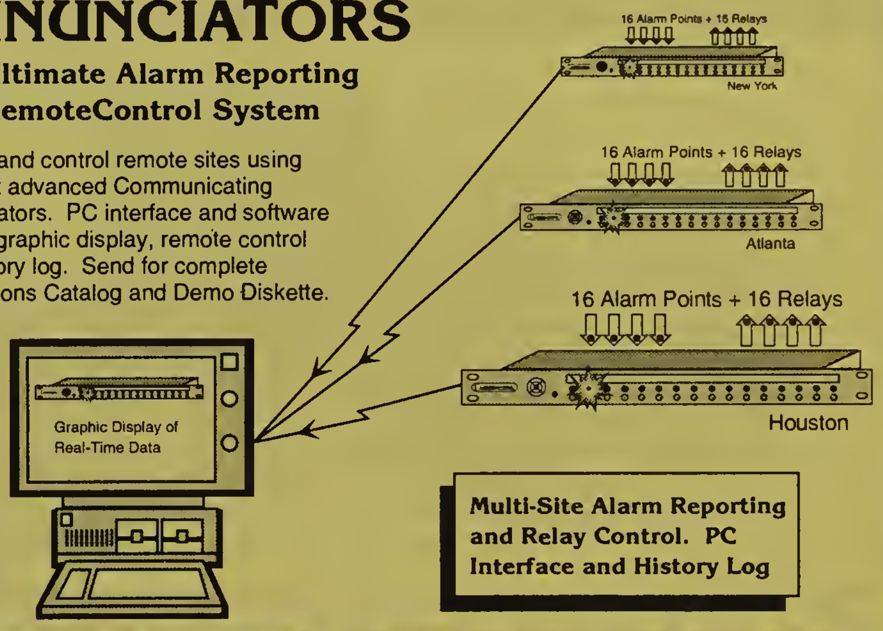
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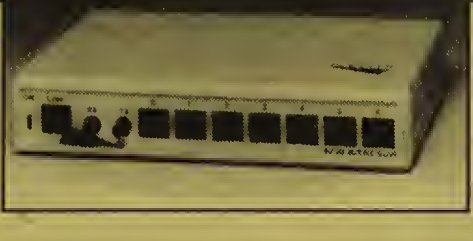

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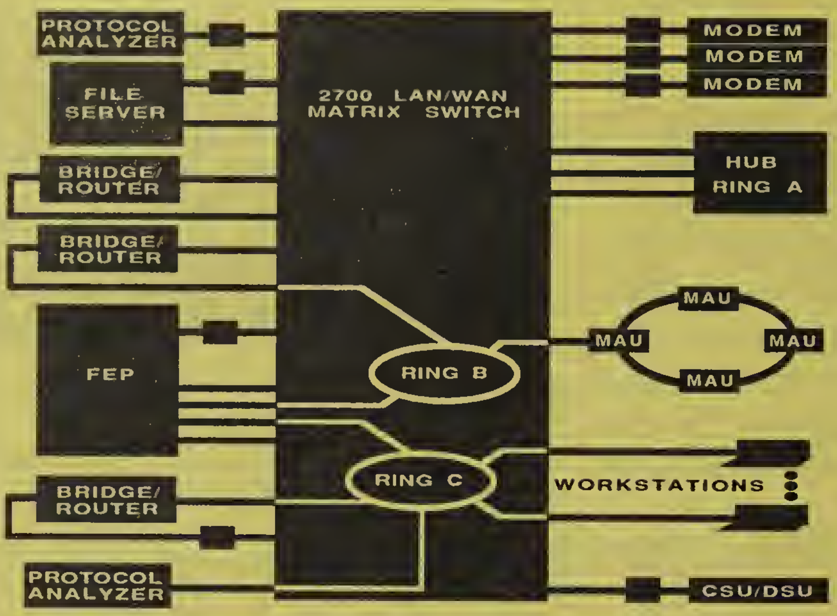

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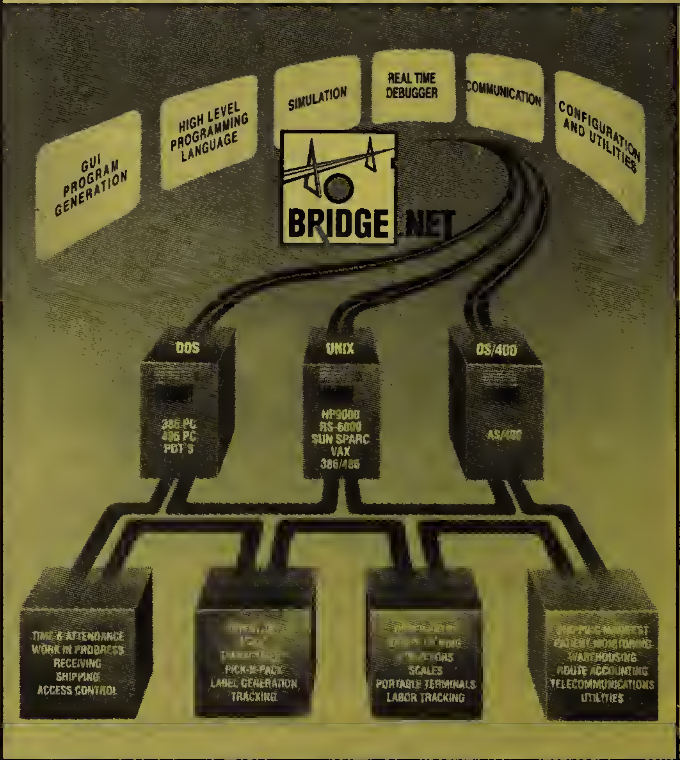

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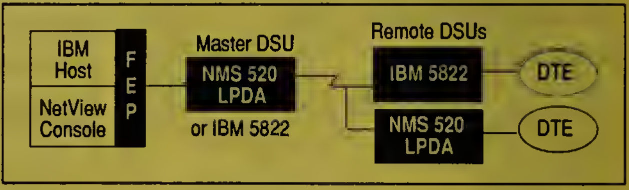

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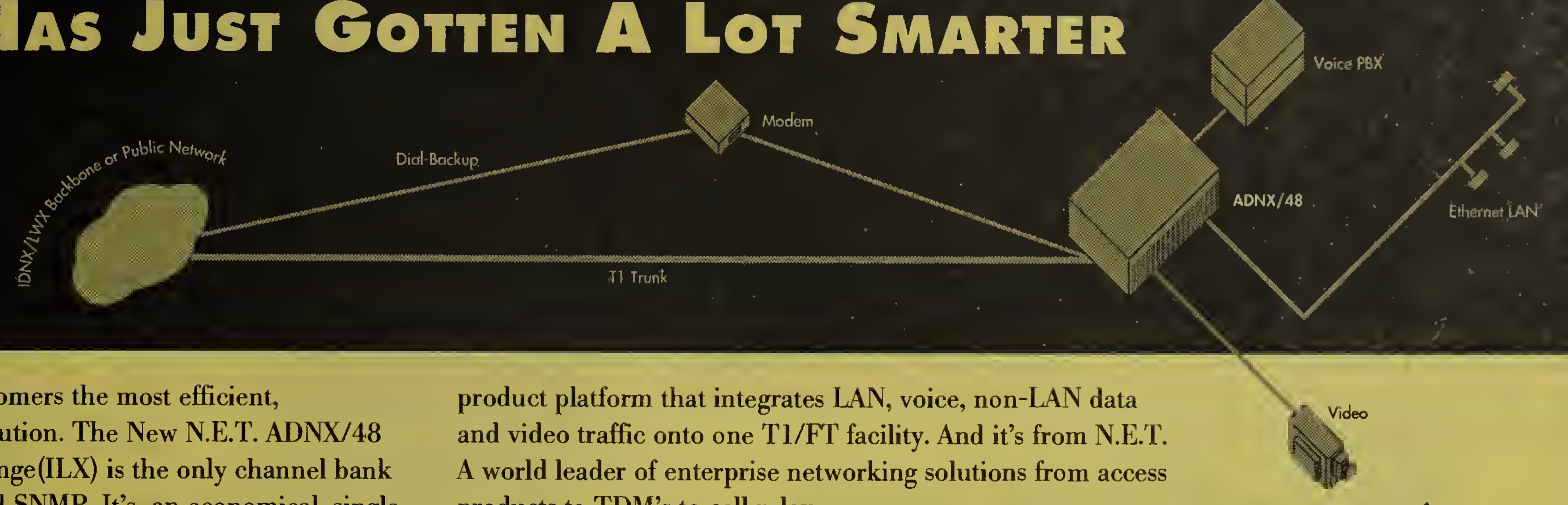

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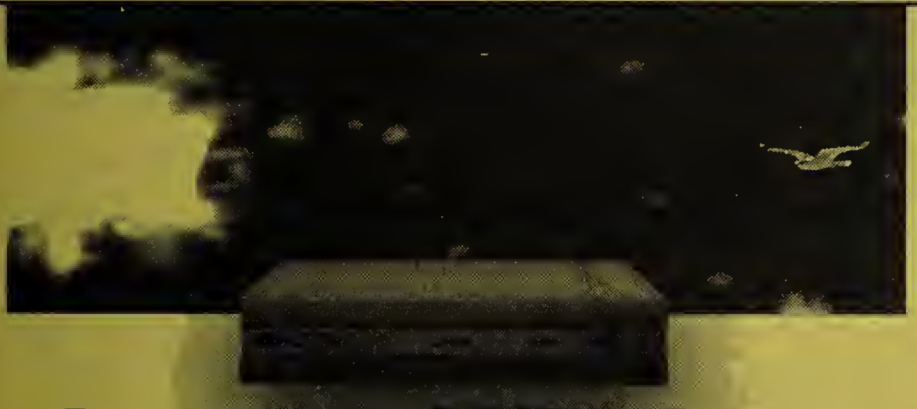

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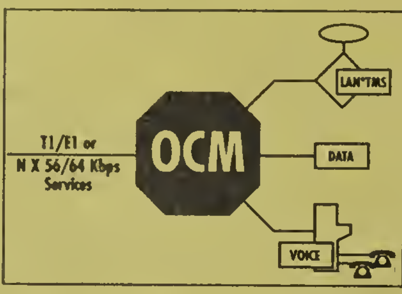

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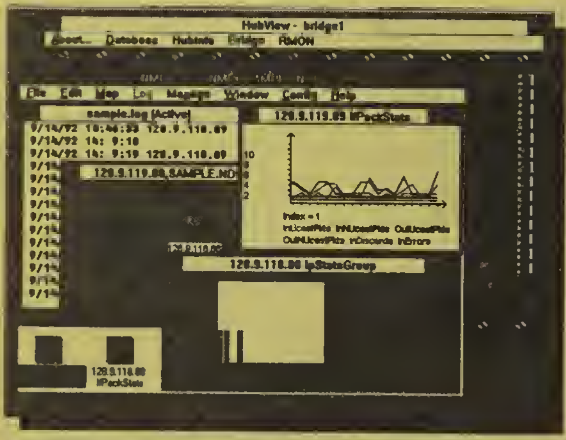
HubView - bridge1
About... Database Hubinfo Bridge RMON
File Edit Map Log Manage Window Config Help
sample.log [Active]
129.9.119.89 IfPackStats
129.9.119.89,SAMPLE.NO
129.9.118.89 IpStatsGroup
Index = 1
InUcastPkts InNUcastPkts OutUcastPkts
OutNUcastPkts InDiscards InErrors

```
9/14/92 10:46:33 129.9.118.89
9/14/92 14: 9:10
9/14/92 14: 9:19 129.9.118.89
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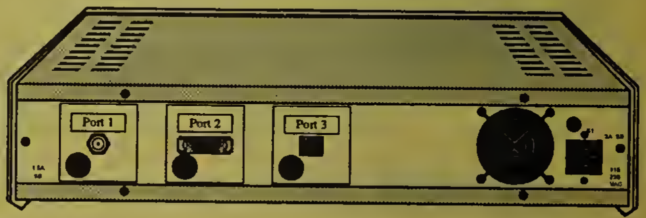

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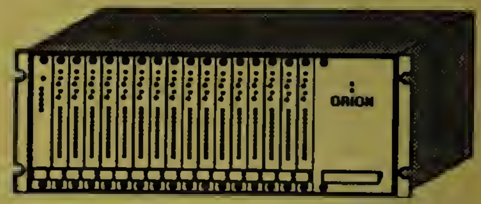

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3. Scope of purchase responsibility
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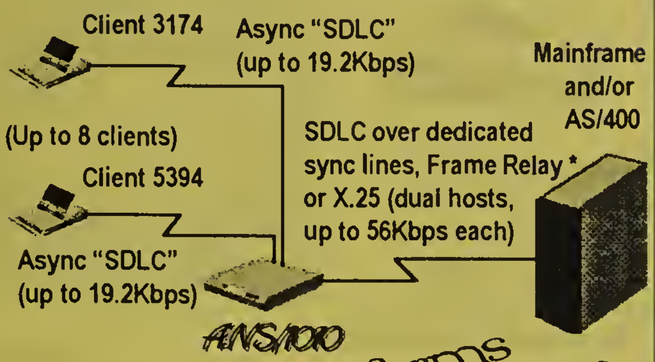
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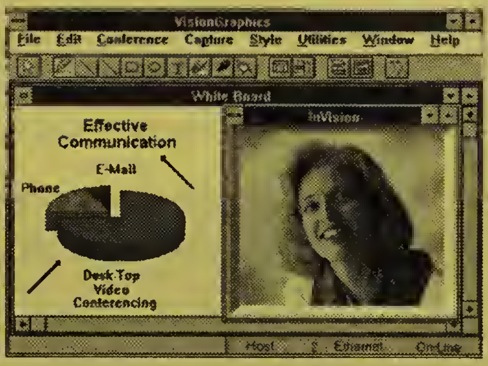

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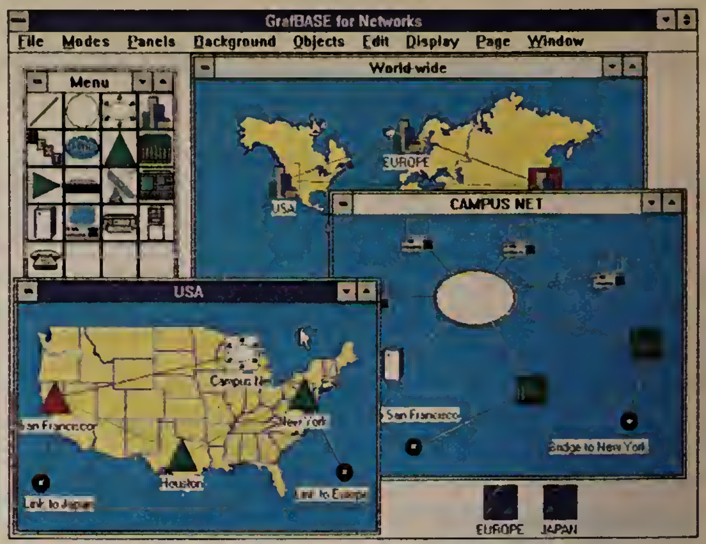

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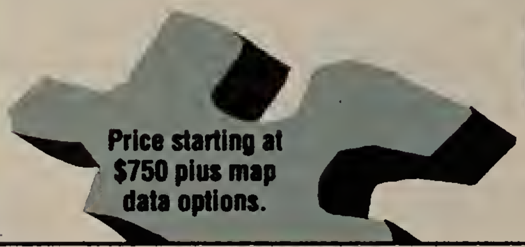

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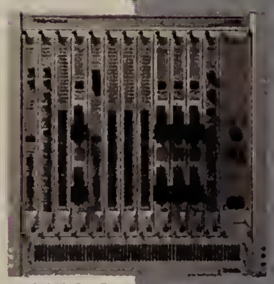

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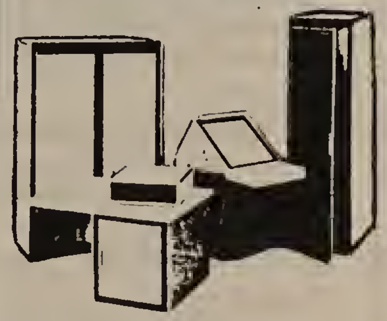

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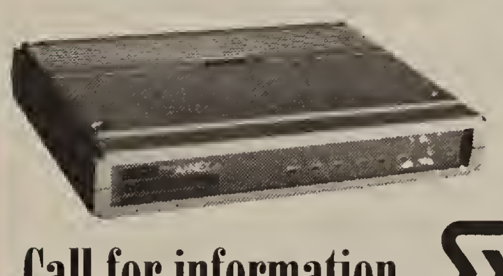

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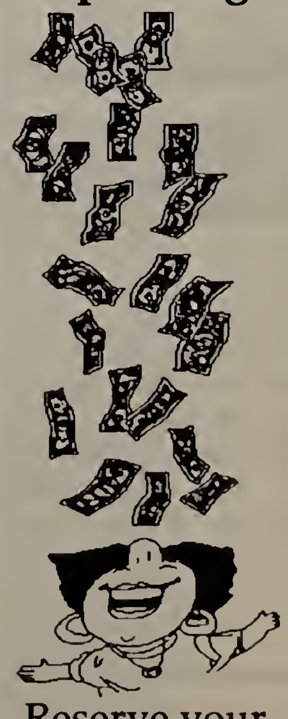

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Candidates should have at least five years recent experience in telecommunications hardware and software management, including hands-on experience with installation and operation of computer networks. Background should include a working knowledge of cabling specifications, network equipment, network management tools, security, and network design. Experience with telephone PBX equipment is desired. Individuals should also have leadership, interpersonal, writing, verbal, and organizational skills, and exhibit flexibility in thinking and working with others. A bachelor's degree with additional training is desired. Successful candidate must relocate to within 10 miles of campus.

Westminster College is a 1466-student private, coeducational, liberal arts college with an operating budget of $25,000,000 located in a small, attractive residential community 55 miles north of Pittsburgh and 17 miles east of Youngstown.

Candidates may apply by sending a current resume with salary history and the names of three refererences by December 17, 1993 to:

Director of Information Systems, Hoyt Computer Center
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Applicants should send their resumes to Professor Charles E. Smith, Search Committee Chair, Department of Electrical Engineering, University of Mississippi, University, MS 38677, by January 31, 1994. The University is prepared to fill this position as soon as possible, but it will remain open until filled. Starting date no later than August 1, 1994. Inquiries can be directed to Professor Smith at (601)232-7231.

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Texas

Continued from page 1

to reap the agency savings of $9 million over five years, said Warren Ressel, manager of network research and planning at TDHS.

TDHS is responsible for the administration and management of welfare assistance programs, food stamps, disaster relief and employment services for the state of Texas. From its 600 offices throughout the state, the agency last year assisted more than three million residents.

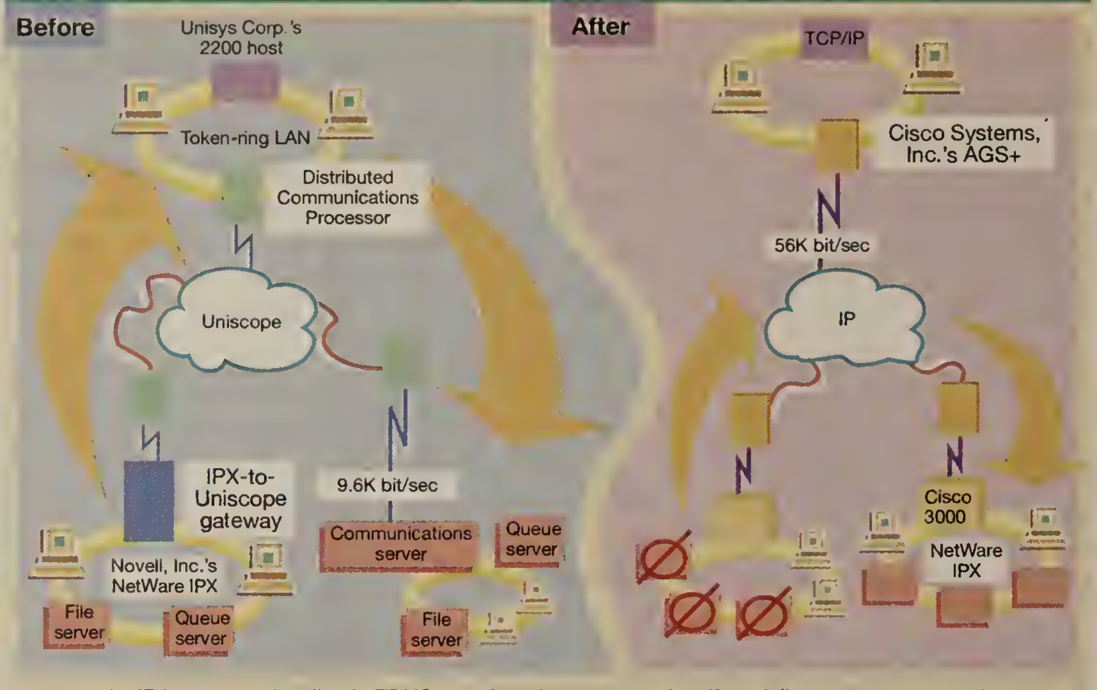
All those offices are linked to the agency's automated welfare delivery net, which is based on a T-1 backbone supported by 10 General DataComm, Inc. Megamux TMS multiplexers.

The net links 500 Novell, Inc. NetWare token-ring LANs to a Unisys Corp. 2200 series mainframe at TDHS headquarters here that houses a database of historical client information and other records. At least 12,000 LAN-attached workstations support electronic case folders about welfare clients. Caseworkers use a combination of the two to determine welfare eligibility and benefits payments.

From its 600 offices, TDHS last year assisted more than three million residents.

On each of the 500 LANs is a gateway that converts Novell's IPX protocol into Unisys' Uniscope protocol so caseworkers can gain access to data on the Unisys host. The gateway also attaches the LANs via 9.6K bit/sec lines to one of 10 Unisys Distributed Communications Processors (DCP), which handle communications processing and routing for the host computer.

Enhancing the welfare of the network



An IP internetwork will help TDHS transform its automated welfare delivery system network into a peer-to-peer structure and obviate the need for a server complex at smaller offices.

GRAPHIC BY TERRI MITCHELL

SOURCE: TEXAS DEPARTMENT OF HUMAN SERVICES (TDHS), AUSTIN, TEXAS

TDHS is looking to gradually replace its DCPs with Cisco Systems, Inc. 7000 and AGS+ routers, as well as add Cisco 3000 access routers to each LAN. The agency will also add Transmission Control Protocol/Internet Protocol software to the LAN gateways and Unisys host, and upgrade the 9.6K bit/sec multidrop lines to 56K bit/sec digital links.

Why? Texas' mandate to adopt TCP/IP as its networking standard has a lot to do with it (*NW*, Oct. 11, page 1). Also, the IP internet promises to be easier to control and more flexible in terms of configuration and application deployment, according to Ressel.

"The whole network management thing really drove us to internetworking," Ressel said. "We have a staff of 81 out in the field to take care of LANs. But we wanted to take control of LANs from up here to provide remote monitoring capability."

TDHS wrote its own LAN monitoring software that surveys NetWare error logs and file server disk storage space, then sends the information here via a nightly electronic mail message. Certified NetWare Engineers examine the message and then fly out to the remote office if there is a problem.

As part of its network upgrade, the agency is now installing Network Computing, Inc.'s LANalert system. LANalert will track and report activities on NetWare servers and workstations, and send Simple Network Management Protocol alerts to a Nynex Allink Co. Operations Coordinator console here. Technicians will then be able to send commands to LANalert, such as to change NetWare configuration files or store data on different disks.

Ressel said the IP net will also save TDHS about $1.4 million in equipment costs.

"We have a lot of small offices with three and four workstations," he said. "We were buying an entire file server complex — file server, communications server and a host query queue server — for those sites. That is running us about $23,000 for the whole setup."

Once the router net is in place, TDHS will instead outfit about 60 smaller sites with $4,000 access routers and 56K bit/sec links, connecting them to server complexes at larger locations, he said.

TDHS will also be able to purchase more shrink-wrapped applications for expanding the capabilities of the automated welfare delivery system network, Ressel said, because applications that can utilize TCP/IP are more abundant than those that use Uniscope.

Some applications will still require DCPs, even though the role of the Unisys communications processors is shrinking. TDHS will still need a couple of the processors to communicate with IBM Systems Network Architecture nets operated by other state agencies and with pharmacies that are filling prescriptions for Medicaid recipients, Ressel said. ◼

Comments

If you have a comment on this or any other article, drop us a fax at (508) 820-3467 or call (800) 622-1108, Ext. 487.

NonStop

Continued from page 1

Under the architecture, personal computers and workstations running mission-critical applications would be outfitted with a new line of UB network interface cards (NIC). The new Gemini adapter card line will include models that will support a variety of PC and workstation bus types in DOS, Windows, OS/2 and Novell, Inc. NetWare environments. The NICs are expected to ship in the first quarter of 1994 and will complement a range of NICs already offered by UB.

Each of the two adapter ports of a Gemini-based workstation would be connected to a separate UB Access/One wiring hub, providing a redundant link into the network. Each hub would then be connected to the same Himalaya server to further extend the redundant paths to the network's resources. Dual local-area network controllers would be added to Himalaya to accommodate separate feeds from the Access/Ones.

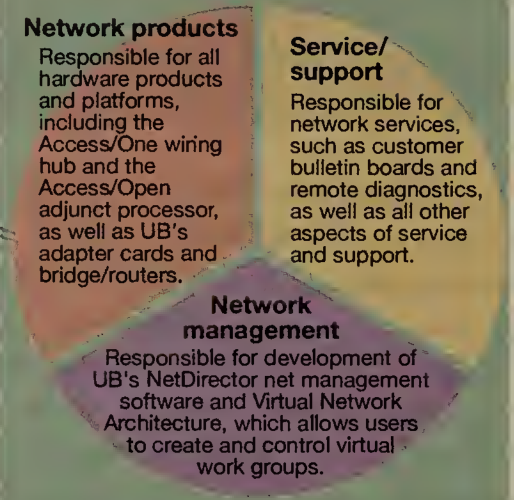
Analysts were somewhat skeptical about UB's strategy. "The first question that leaps to mind is, why make users buy two Access/One hubs as opposed to developing a fault-tolerant hub?" said Todd Dagres, vice president of data communications at The Yankee Group, a consultancy in Boston. "That strategy runs counter to the Tandem approach of rolling out fault-tolerant devices and makes building reliable networks under the plan a bit cost-prohibitive."

To deliver the fault-tolerant product architecture and turn the company's financials around, Pieper will restructure UB into three for-profit business units that will focus on service/support, net management and network products (see graphic, this page).

The new groups, which were formed to consolidate development work that previously took place in many separate smaller units, are scheduled to be operational early next year. ◼

UB's new look

UB is reorganizing into the following 3 divisions:



Network products
Responsible for all hardware products and platforms, including the Access/One wiring hub and the Access/Open adjunct processor, as well as UB's adapter cards and bridge/routers.

Service/support
Responsible for network services, such as customer bulletin boards and remote diagnostics, as well as all other aspects of service and support.

Network management
Responsible for development of UB's NetDirector net management software and Virtual Network Architecture, which allows users to create and control virtual work groups.

SOURCE: UNGERMANN-BASS, INC., SANTA CLARA, CALIF.

Novell

Continued from page 1

Providing the transport mechanism is the hard part."

Walter Dymek, an associate analyst at Datapro Information Services Group in Delran, N.J., said Novell's effort fits neatly into IBM's own networking blueprint strategy under which it seeks to let users employ their choice of transport protocols. Today, IBM supports Systems Network Architecture, Network Basic I/O System, Advanced Peer-to-Peer Networking, TCP/IP and Open Systems Interconnection protocols.

"The primary push is coming from users who say they want to bring their Novell LANs into their existing IBM network. IBM has done that with their TCP/IP network stacks, but that's not enough," Dymek said.

But the project is not all wine and roses.

Although sources say mainframe IPX/SPX software is under development, there's no guarantee it will turn into a product. Novell has, in the past, done development work on products it never brought to market. Second, this is not something all users will need.

"We're a large organization. It's cheaper for us to put TCP/IP on the mainframe and use gateways to connect our NetWare LANs," said one user who requested anonymity.

This user suggested the types of customers that would be most interested in this product would be "blue shops, without a lot of diversity in their nets — those that just have IBM and NetWare and don't have to worry about connecting VAXes and Unix boxes and [Apple Computer, Inc.] Macintoshes." ◼

NETWORK WORLD

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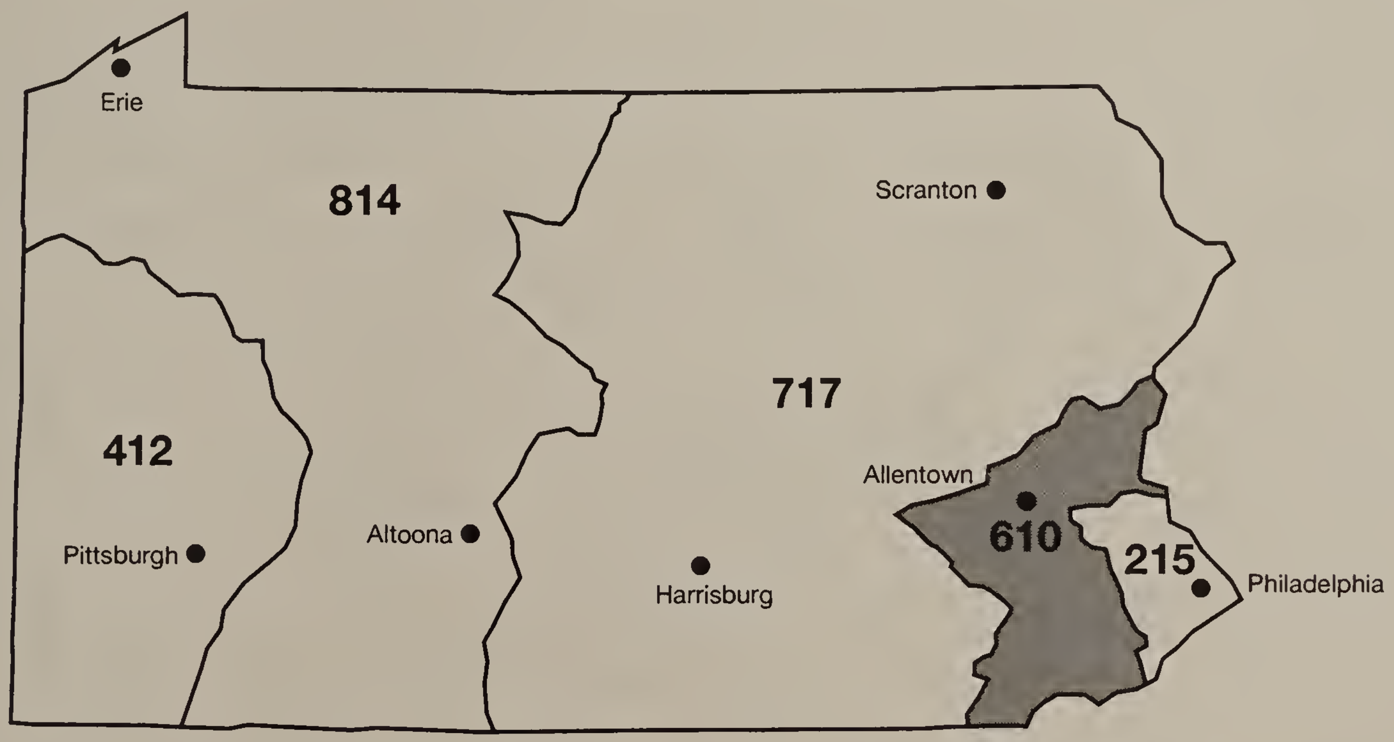

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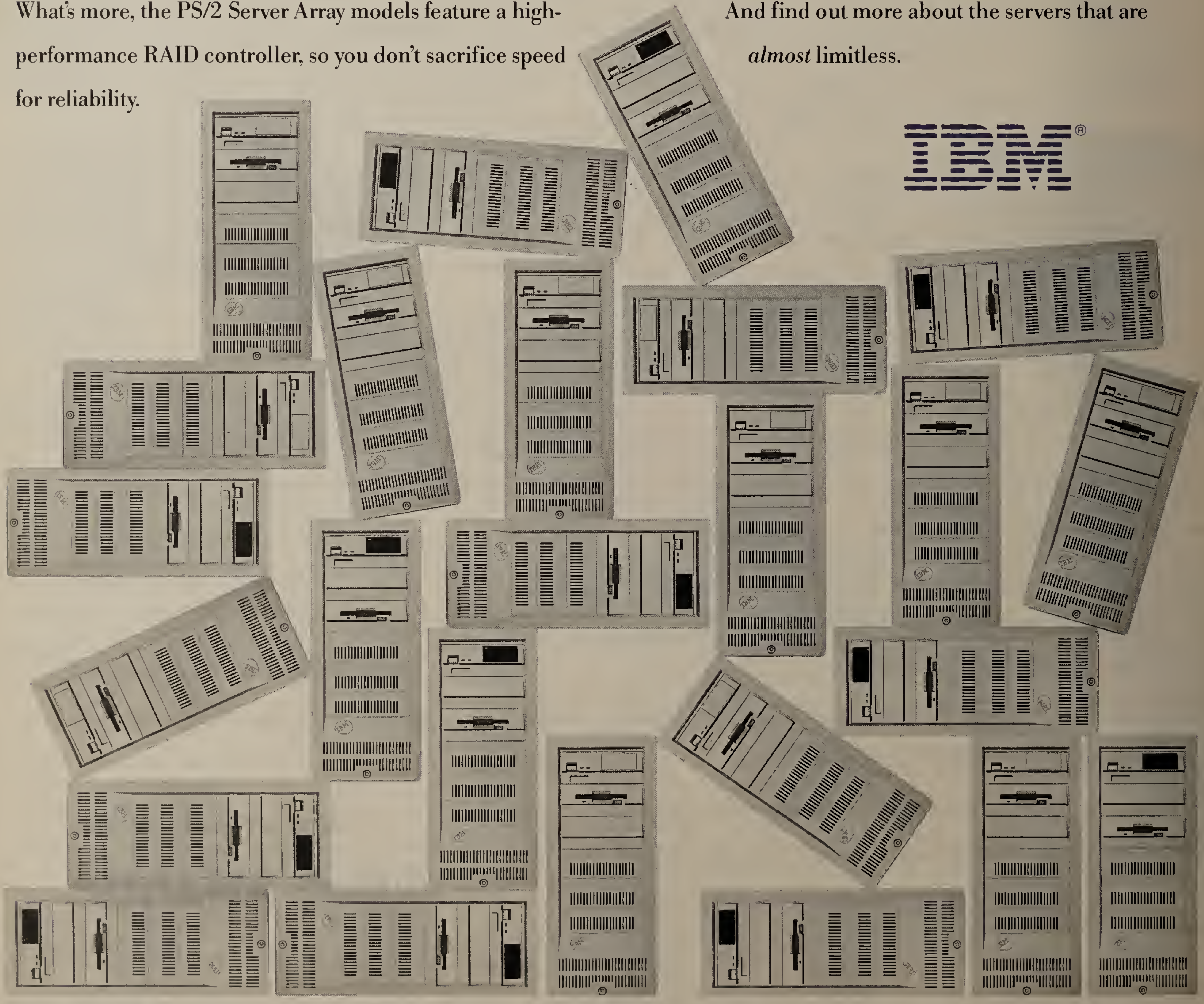

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